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As the Editor Views the News

FROM present indications, the first projects under the work relief program to yield substantial orders for iron and steel will be those covering the elimination of grade crossings. A sum of from $600,000,000 to $800,000,000 is earmarked for grade elimination and highways, to be equally divided between the two classifications. From 800,000 to 2,000,000 tons of steel (p. 10) will be involved. Industry has been advocating the use of public funds for grade crossing elimination since the early days of PWA. It seemed a more plausible type of project than the building of roads in remote national parks and Indian reservations.

• • •

Better Late Than Never

Had grade separation work been taken up seriously under PWA, many lives would have been saved and badly needed business would have been provided for contractors, steel producers and fabricators, and manufacturers of cranes, shovels, buckets and other handling equipment. These interests suffered more acutely during the depression than companies in many other industries. Revival of their business would have stimulated employment where the need was greatest. It is a sad commentary on the efficacy of a highly touted planned economy that it required a terrible grade crossing accident in Maryland to shock officialdom into doing what common sense dictated should have been done nearly two years ago.

• • •

Price Policy for NRA

Congress is shifting into high gear in its effort to shape legislation for extending NRA. Thus far it is difficult to forecast what action will be taken on price policy. Washington observers believe price control provisions will be weakened or thrown out (p. 15), but a statement just issued by NIRB (p. 11) indicates that the board favors price filing for certain industries. Moreover, the amendments to the bill introduced Friday by Senator Harrison show that the necessity of curbing price cutting (p. 11) is recognized. Apparently an effort is being made to strike a balance between cut-throat competition on one extreme and outright price fixing on the other. If congress would write a sensible bill, outlining clearly what business can or cannot do under the antitrust laws, it would rate three lusty cheers from industry.

• • •

Simplified Measurements

Industry will watch closely the experience of the Ford Motor Co. in promoting the use of a decimal system of measurement in its manufacturing operations. Under this system (p. 28), which was adopted about two years ago, the inch is divided into decimal fractions instead of common fractions. The obvious advantage claimed for the Ford system is that tenths, hundredths, etc., involve simpler calculations than eighths, thirty-seconds, sixty-fourths, etc. It is significant that the company is not advocating the metric system, but is introducing a simplification of the existing English system of measurement. Therefore the Ford experiment should not revive the old feud between the American Institute of Weights and Measures and the American Metric association.

• • •

A Lesson in Merchandising

The typical American farmer is traditionally sensitive in regard to the amount of zinc on the galvanized sheet roofing or fence wire which he buys. His insistence on this point has prompted sheet steel and zinc interests to inaugurate campaigns to emphasize the quality of their galvanized products. These movements usually involve attempts to establish standards for minimum coatings of zinc. Now it appears that the latest program of this kind is in danger of defeating its own purpose. Speakers at the annual meeting of the American Zinc institute warned its members (p. 37) that the program is "driving farmers to the use of composition roofing." This again emphasizes the fact that intelligent merchandising is an intricate problem—one that constantly challenges the best minds of industry.

E. L. Shaner

New Bureau To Speed Relief Funds Into Steel Tonnage

WASHINGTON

PRELIMINARY work on setting up a division of grade crossing elimination in the bureau of public roads, department of agriculture, was started last week on the initiative of the President in order to facilitate an early start on the most important iron and steel consuming portion of the $4,000,000,000 work relief program.

Estimates of funds probably available for grade crossing elimination and for highways range from $600,000,000 to $800,000,000, with probably an even split between these classifications. As to iron and steel requirements, only the vaguest conjecture is possible, with estimates ranging from 800,000 to 2,000,000 tons.

Funds for work relief program become available July 1, but any outstanding projects that pass scrutiny and are ready to go ahead are expected to by-pass the time hurdle and proceed promptly. It is unofficially said that the bureau of public roads has plans on hand for about 1800 grade crossing elimination projects, but so far as can be determined few are sufficiently detailed to warrant taking bids immediately.

States' Shares Allocated

Much of the uncertainty over the prospective requirement for iron and steel arises from the lack of definite plans. In general, where railroad tracks are elevated over highways, structural steel will predominate; where highways pass over railroads, reinforced concrete is expected to be the favored material.

There is, however, no uncertainty concerning the method of allocating grade crossing elimination and highway funds. In the relief bill itself there is a definite breakdown by states based upon each $100,000,000 available. For example, if the President directs $400,000,000 each to be spent for highways and grade crossings, the sums set aside to the states in the following table would be multiplied in each column by 4:

State	Highways[1]	Grade crossings[2]
Alabama	$2,129,000	$2,073,000
Arizona	1,318,000	652,000
Arkansas	1,719,000	1,831,000
California	3,973,000	3,794,000
Colorado	1,742,000	1,362,000
Connecticut	728,000	874,000
Delaware	462,000	221,000
Florida	1,332,000	1,450,000
Georgia	2,559,000	2,522,000
Idaho	1,140,000	870,000
Illinois	4,458,000	5,260,000
Indiana	2,534,000	2,624,000
Iowa	2,560,000	2,365,000
Kansas	2,561,000	2,644,000
Kentucky	1,911,000	1,894,000
Louisiana	1,482,000	1,650,000
Maine	860,000	734,000
Maryland	898,000	1,070,000
Massachusetts	1,673,000	2,110,000
Michigan	3,232,000	3,382,000
Minnesota	2,706,000	2,760,000
Mississippi	1,773,000	1,675,000
Missouri	3,083,000	3,164,000
Montana	1,885,000	1,428,000
Nebraska	1,985,000	1,852,000
Nevada	1,150,000	457,000
New Hampshire	485,000	424,000
New Jersey	1,604,000	2,038,000
New Mexico	1,473,000	914,000
New York	5,665,000	6,930,000
North Carolina	2,421,000	2,490,000
North Dakota	1,470,000	1,702,000
Ohio	3,934,000	4,280,000
Oklahoma	2,349,000	2,383,000
Oregon	1,558,000	1,211,000
Pennsylvania	4,793,000	5,901,000
Rhode Island	507,000	359,000
South Carolina	1,386,000	1,510,000
South Dakota	1,526,000	1,464,000
Tennessee	2,150,000	1,943,000
Texas	6,148,000	5,591,000
Utah	1,061,000	641,000
Vermont	474,000	376,000
Virginia	1,873,000	1,939,000
Washington	1,552,000	1,569,000
West Virginia	1,144,000	1,375,000
Wisconsin	2,474,000	2,578,000
Wyoming	1,138,000	726,000
District of Columbia	487,000	201,000
Hawaii	475,000	237,000
Total	$100,000,000	$100,000,000

[1]Sec. 204 national industrial recovery act; ⅞ federal aid; ⅛ population.
[2]½ population; ¼ mile federal-aid highway system; ¼ mile railroad.

Piecemeal—possibly for greater publicity—the President last week began announcing his relief program. So far as classifications of expenditures are concerned they break down as follows:

1. Highways-roads. Includes grade crossing eliminations, acquisition of land, bridges, culverts, tunnels, routes. $600,000,000 to $800,000,000.
2. Rural rehabilitation. Includes relief in stricken agricultural areas, water conservation, trans-mountain water diversion, irrigation, reclamation, rural industrial communities, subsistence homesteads and soil erosion. $500,000,000.
3. Rural electrification. $100,000,000.
4. Housing. Includes low-cost housing in rural areas (reconditioning and remodeling). $450,000,000.
5. Assistance to clerical and professional persons. $300,000,000.
6. Civilian conservation corps. $600,000,000.
7. Loans and grants or both to political subdivisions. $900,000,000.
8. Sanitation. Includes prevention of soil erosion, stream pollution and seacoast erosion; reforestation and afforestation, flood control, rivers and harbors, and miscellaneous projects. $350,000,000.

Out of these eight sub-divisions, it is expected that iron and steel will be required chiefly in 1, 2, 3, 4 and 8, with some needs for shelter of the CCC in classification 6 (CCC is to be doubled) and in an indeterminate amount in 7.

It is a matter of pride with the President that the great bulk of relief work can be carried on by existing agencies of the government, but

As head of the newly-formed division of applications and information, in Washington, Frank C. Walker becomes the official sieve for all projects put forward, as candidates for financing under the new $4,000,000,000 work relief act. He formerly was treasurer of the Democratic national committee, and for a time was secretary of President's national emergency council. He is accredited to Montana and New York

Harris & Ewing Photo

three new setups are needed: (1) The grade crossing elimination division previously mentioned, (2) a bureau for rural resettlement under Assistant Secretary of Agriculture Tugwell, and (3) a new division in charge of rural electrification.

The routine of distributing the $4,000,000,000 begins with a division of applications and information in charge of Frank C. Walker, former treasurer of the Democratic national committee and early in the Roosevelt administration chairman of the national emergency council. To Mr. Walker's division will go all applications. They will not be passed upon except in general terms, but will be routed to the appropriate bureau or government official.

Ickes Directs Allotments

It is still conjecture but, presumably after the appropriate bureau or division has sifted out desirable projects, the latter will be returned to a works allotment division of which Secretary of the Interior Ickes, present PWA administrator, has been appointed chairman.

In addition to Secretary Ickes as chairman, the works allotment division comprises:

Secretary of Agriculture Henry A. Wallace; Secretary of Labor Frances Perkins; Mr. Walker; director of procurement, Rear Admiral Christian J. Peoples; Budget Director Daniel W. Bell; Chief of Army Engineers, Maj. Gen. Edward M. Markham; Commissioner of Reclamation Elwood Mead; director of soil erosion, Hugh H. Bennett; chief of forest service, F. A. Silcox; director of emergency conservation work, Robert Fechner; chief of the bureau of public roads, Thomas H. MacDonald; director of rural resettlement, Rexford G. Tugwell; chief of urban housing division, Col. Horatio B. Hackett; representative of the business advisory council, probably Harry Kendall, head of the council. Also one representative each for organized labor, farm organizations and the American Bankers' association, and the yet-unnamed heads of the director of rural relief, rural electrification and grade crossing elimination bureaus, and Harry L. Hopkins, FERA administrator and now made head of the progress division.

The President, however, will make the actual allocations.

Still another facet of the works relief program is the progress division, in charge of Mr. Hopkins. He will be the co-ordinator exercising supervision over the 43 government bureaus and divisions which will function in connection with the relief program.

The picture thus is this: Applications for funds will clear through the division of applications and information under Mr. Walker. Recommendations for allotment of funds will be issued by Secretary Ickes' works allotment division. Supervision of expenditures and also of the co-operating government agencies is vested in Mr. Hopkins. And the President will be chief of this general staff.

NRA Extension Bill Amended To Hit Price Cutting; NIRB for Open Prices

SEN. PAT HARRISON, chairman of the senate finance committee, Friday introduced a series of amendments to the NRA extension bill.

One gives the federal trade commission power to curb price cutting and places code administration in the hands of the government. The price cutting amendment would give the trade commission authority to issue a temporary order against persons to "cease and desist" destructive price cutting.

Another amendment would prevent any committee made up of persons engaged in industry from acting in any way as though they were in possession of a government grant of authority.

Still another amendment would write into the bill the specific statement that nothing in the title referring to codes "shall be construed as amending or repealing any provisions of the antitrust laws."

According to Senator Harrison, his finance committee will shortly report out the bill. The first barrage it will encounter is expected to arise from Senator Borah and other liberals who may not be satisfied that the amendment relating to antitrust laws goes far enough.

Last week the national industrial recovery board issued the first of its statements of policy as a result of the public hearings held in January. Incidentally, Charles Edison, of West Orange, N. J., son of the late inventor, has been appointed an industrial representative on the board succeeding Arthur D. Whiteside, president of Dun & Bradstreet's, who is voluntarily retiring.

This statement of policy defends

(*Please turn to Page 74*)

Acme photo

Eugene G. Grace, president, Bethlehem Steel Co., (left) was witness in Pittsburgh last week in the government's tax suit against Andrew W. Mellon (right). On the stand for the government, Mr. Grace traced the steps in acquisition of the McClintic-Marshall Corp. by Bethlehem. The government contends it was not a merger but a sale of assets, and hence taxable to a greater extent. Before leaving Pittsburgh Mr. Grace commented on current conditions:

"The relationship between steel employers and steel employes was never better. In our plant, at least, the men don't want the American Federation of Labor. They like the employes' representation plan. Our's is the oldest, as it started 16 years ago . . . When the working man wants unionization, he can have it. But when the government passes legislation to force employes to recognize a certain type of organization—if that's not coercion I don't know what it is . . . . Now they're trying to legislate the 30-hour week when our men want more opportunity to work. Of course, people say you could increase wages and reduce hours, but that's economically unsound. Our men are satisfied now with the rates of pay."

Transportation

A BULLETIN by the American Iron and Steel institute shows the following situation in regard to the application of emergency charges to intrastate freight rates following the interstate commerce commission increase of 7 per cent, or a maximum of 2 cents per 100 pounds effective April 18 on interstate rates:

From	To Points In Following States	Effective Date
Chicago, Waukegan	Illinois	April 18
Anderson, Gary, Muncie	Indiana	†
Worcester	Massachusetts	April 18
Sparrows Point	Maryland	April 18
Detroit	Michigan	†
St. Louis	Missouri	†
Jersey City, Trenton	New Jersey	†
Buffalo, Syracuse	New York	April 18
Canton, Cleveland, Lorain, Massillon, Portsmouth, Shelby, Youngstown	Ohio	†
Bethlehem, Coatesville, Columbia, Danville, Lebanon, Philadelphia, Pittsburgh, Steelton	Pennsylvania	†
Richmond	Virginia	†
Weirton	West Virginia	†
Milwaukee	Wisconsin	†

†—Increase not yet authorized.

New Capacity

AMERICAN SHEET & TIN PLATE CO., Pittsburgh, subsidiary of the United States Steel Corp., is daily expected to announce the definite award of a 72-inch continuous hot and cold rolled strip mill for its Gary, Ind., plant.

It is reported in the trade that the United Engineering & Foundry Co., Pittsburgh, will build the hot mill and the Continental Roll & Steel Foundry Co., Chicago, the cold mill.

FORD BUYS COKE OVENS

Ford Motor Co., Dearborn, Mich., has awarded 67 by-product coke ovens at its River Rouge plant to a Pittsburgh district interest, as yet not officially named. The cost will be $4,000,000.

Foreign Trade

IMPORTS of iron and steel in March totaled 21,409 gross tons, compared with 28,905 tons in February and 38,393 tons last March. First quarter total of imports thus is 73,098 tons, compared with 86,453 tons a year ago, states the iron and steel division of the department of commerce. The feature of March imports is a sharp rise in barbed wire, to 3364 tons. Pig iron imports in the first quarter were only 15,482 tons, one-third of 1934.

Complete data on March imports, and also on March exports, will be carried in STEEL for May 6.

Institute

FOLLOWING are new commercial resolutions and amendments promulgated by the American Iron and Steel institute last week:

A-21 has been further amended so that when reference is made to the all-rail published tariff carload rate from Pittsburgh to determine whether the delivery point is within that part of Michigan outside of Detroit to which the provisions of this resolution apply, the rate shall be deemed that effective on April 1.

New Delivered Price Basis

Resolution A-41 declares that the place of delivery of concrete bars from warehouses in New York and Newark or Jersey City, N. J., shall be that place where the purchaser takes truck delivery, and the delivered price shall be figured on that basis.

A-42 rules that the seller will not be required, in determining delivered prices, to add handling charges for trans-shipment from cars on dock to barge or boat.

A-43 declares that the seller in making water shipments in lots of 200 tons or more by water may determine the delivered price on the basis of the railroad freight station nearest the site.

Amendment to Resolution No. A35 treats with reductions in the delivered prices of certain wire products when such prices are determined on the basis of prices at Gulf port basing points.

Five amendments, effective April 25, are made to regulations No. 2. Three are worded to include manufacturers of lead-lined pipe as among those permitted certain reductions. The fourth allows manufacturers of formed roofing a deduction of $4 a ton on No. 26, 28 and 29 gage sheets in addition to the existing $2 deduction on all other grades. The fifth is a minor amendment.

Sic Transit Century of Progress, via Wreckers

BY SEPTEMBER the iron and steel which helped to provide the spectacle of A Century of Progress at Chicago will have been scattered to the four winds.

Building the fair required about 20,000 tons of iron and steel, including ornamental iron, flag poles, fences, etc. Of this total only several hundred tons will remain in permanent structures when the dismantling, now being carried out by Baker-Goldman-Lubin, Chicago, is completed this fall.

About 60 per cent of the iron and steel is being salvaged, the remaining 8000 tons being disposed of as scrap. Scrap is prepared on the grounds and sold for nearby consumption.

A fairly large market for such material as steel siding and channel decking has been provided by farmers who have trucked it to their farms to be used for repair purposes.

Structural shapes are being salvaged and shipped by rail and barge as far east as New York and as far west as Kansas.

When the fair buildings were erected, construction methods were adopted to provide the largest amount of salvaged material possible.

Production

STEELMAKING held its ground last week, maintaining the 46 per cent level of the week previous. Declines at Youngstown, Cleveland, New England, Buffalo and eastern Pennsylvania were neutralized by gains of 1 and 2 points at Pittsburgh and Chicago. Details follow:

Youngstown—Eased 2 points to 56 per cent last week and valley mills are expected to operate at this level this week.

Birmingham—Held at 54½ per cent last week, with little or no change indicated immediately.

Pittsburgh—Up 1 point to 37 per cent last week with local operations being strongly supported by a leading independent. The leading local interest operated through last week at about 35 per cent. Twenty out of 60 steelworks furnaces continue ac-

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended April 27	Change	Same week 1934	Same week 1933
Pittsburgh	37	+ 1	46	21
Chicago	52	+ 2	59	26
Eastern Pa.	29	—½	41½	15
Youngstown	56	— 2	58	30
Wheeling	76	None	79	†
Cleveland	57	— 5	80	41
Buffalo	34	— 3	68	35
Birmingham	54½	None	52	17
New England	25	—27	89	†
Detroit	82	None	94	†
Average	46	None	57	29

†Not reported in 1933

tive. Carnegie Steel Co. is operating 8 of 32; American Steel & Wire Co., 1 of 2; Jones & Laughlin Steel Corp., 6 of 11; Bethlehem Steel Co., 3 of 7, and Pittsburgh Crucible Steel Co., and Pittsburgh Steel Co., 1 of 2 each. At the beginning of this week a gain of about one point is in prospect.

Buffalo—Down 3 points to 34 per cent, with 13 open hearths in production. Expectations are for further curtailment this week, with the general outlook for May not very promising.

Chicago—Increased 2 points to 52 per cent, the best rate since early March. Steelmaking is holding better than was anticipated early this month and a relatively steady rate is in prospect for the next few weeks. Blast furnace schedules continue at 16 active steelworks stacks out of 36.

Central eastern seaboard—Off fractionally to 29 per cent, and with a modest decline in new business, the trade regards a further easing tendency in steel production as an early possibility. At present, the operating rate is being bolstered considerably by continued good production at Sparrows Point, Md., particularly for tin plate.

New England—Off 27 points to 25 per cent last week, the sharpest break in more than a year. All open-hearth capacity was taken off with the exception of three units. A gain of a few points is expected during this week.

Wheeling—Unchanged at 76 per cent, with 28 open-hearth furnaces out of 37 actively making steel.

Detroit—Held steady at 82 per cent last week, with 14 open hearths continuing on active schedule.

Cleveland-Lorain—Down 5 points to 57 per cent, Corrigan, McKinney Steel Co. taking off two open hearths to operate nine; Otis Steel Co. continuing with six, and National Tube Co. with 7. The reduction at Corrigan, McKinney is due to suspension of operations at the Monroe, Mich., plant of Newton Steel Co., one of its affiliates, caused by a strike.

SHEET SALES OFF IN MARCH BUT SHIPMENTS INCREASE

Daily average sheet steel sales of independent producers reported by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, were lower in March than in February, but shipments increased. Sales dropped from 6547 net tons to 6228 tons; production from 7823 tons, to 7325 tons, while shipments rose from 7080 tons to 7530 tons. Association totals for March: Sales 193,057 tons; production 227,082 tons; shipments 233,446 tons. The capacity on which the association reports were based was 307,000 tons, while total capacity in the United States for March was 550,000 tons.

Welders Review Year of Progress; Crowe Is President

INCREASED membership with organization of additional sections well advanced at Baltimore and Milwaukee and proposed chapters at Toledo, Salt Lake City and Denver, are indicative of a year of progress as reported at the sixteenth annual meeting of the American Welding society, Hotel Pennsylvania, New York, April 25.

Not only were sectional activities productive of increased interest in welding, but reports of special committees also revealed steady progress.

J. J. Crowe

Dr. D. S. Jacobus, Babcock & Wilcox Co., New York, retiring president, was presented with a past-president's medal.

J. J. Crowe, Air Reduction Sales Co., Jersey City, N. J., was elected president, and E. R. Fish, Hartford Steam Boiler Inspection & Insurance Co., senior vice president.

New divisional vice presidents include: Turner C. Smith, General Petroleum Corp. of California, Los Angeles, Pacific Coast section, and E. E. Gillman, Wyatt Metal & Boiler Co., Dallas, Texas, southern section.

New directors are C. A. Adams, Harvard engineering school, Cambridge, Mass.; H. M. Hobart, General Electric Co., Schenectady, N. Y.; F. T. Llewellyn, United States Steel Corp., New York; K. D. Spackman, Lukenweld Inc., Coatesville, Pa., and H. L. Whitney, M. W. Kellogg Co., New York.

In approximately 140 cities welding codes have been adopted, whole or in part in the building regulations of these municipalities, the committee being active in co-operation.

Code 2 for resistance welding of structural steel restricts application of resistance welding on some lighter members, such as joists, light trusses, stair stringers and other small parts, which by reason of their shop fabrication in multiple quantities, can be subjected to definite qualification tests. Allowable working stresses are the same as those in code 1 and a minimum safety factor of 3 is required for the weakest member or joint of any product manufactured by resistance welding equipment.

The Philadelphia city planning commission requested this code, while the department of internal affairs of Pennsylvania was given data on the revised code for the application of fusion welding to structural steel. The department is working on a proposed building code for the state.

Other Cities Amend Rules

Welding data were also supplied New Britain, Conn., for inclusion in building rules of that city. Similar information was also given Chicago to assist in the preparations of welding regulations for a revised building code. Numerous requests from other cities and public work departments have applied for material to be used in building regulations. G. D. Fish is chairman of this committee.

Application has been made for a charter by the recently-organized Baltimore section following a promotional meeting at which considerable interest developed with the election of officers. Organization of a Milwaukee section is well under way, with temporary officers elected.

President D. S. Jacobus reported in detail activities of the year and reports of the work of all sectional chapters were briefly submitted. At Philadelphia a lecture course resulted in an increase of 100 new members. Chicago was active in the organization of Milwaukee, and 400 attended the meeting in the latter city. Detroit has been active in building enrollment from the resistance welding field.

Boston was instrumental in overcoming detrimental legislation, including a proposal requiring a 5-year apprenticeship for welders. A

(*Please turn to Page* 76)

Financial

FIRST batch of financial reports for the first quarter of 1935 indicates it is almost a toss-up whether the industry was in the black or the red in that period, with the odds slightly in favor of the red.

Seven integrated producers have thus far reported—Republic, Wheeling, Gulf States, Ludlum, Bethlehem, Jones & Laughlin, and Youngstown. They represent 34 per cent of the country's ingot capacity. Profits of the first four exceed the deficits of the latter three by $1,031,256.

Since the United States Steel Corp. lost over $10,000,000 in the last quarter and $7,000,000 in the first quarter of 1934 it seems unlikely that a profit for the first quarter of this year will be reported next Tuesday. Such profit makers as National, American Rolling Mill and Inland will have to roll up substantial earnings to cancel the expected Steel corporation loss.

Of the companies to report thus far, Republic has supplied an outstanding showing, making over $1,800,000 in the March quarter.

BETHLEHEM IN RED BUT CUTS DEFICIT FROM LAST YEAR

Bethlehem Steel Corp., Bethlehem, Pa., piled up a deficit of $607,298 in the first quarter, after all charges. This is a reversal of the profit of $411,099 made in the fourth quarter, but a substantial whittling down of the deficit of $902,044 encountered in the first quarter of 1934. Details of Bethlehem follow:

	First Quarter 1935	Fourth Quarter 1934
Total income of the corporation and its subsidiary companies	$4,474,640	$5,707,411
Less—Interest Charges	1,615,045	1,744,309
Balance	$2,859,604	$3,963,102
Less—Provision for depletion and depreciation	3,466,902	3,552,003
Net income for the period	*$ 607,298	$ 411,099

*Deficit.

Queried concerning the steel outlook, E. G. Grace, president, forecast little change over the next few weeks. Automotive requirements might taper toward the end of this quarter, but should be offset later by public works.

Unwilling to discuss the future of NRA, Mr. Grace emphasized that if certain of the proposals made recently concerning the basing point system (referring to the federal trade commission and NRA reports) were made effective they would "destroy millions and millions of dollars of investments in the steel industry."

REPUBLIC NET $1,834,235; OFFERS EMPLOYES INSURANCE

Republic Steel Corp., Youngstown, O., made a profit of $1,834,235 in the first quarter after all charges, estimated federal taxes and payment of the guaranteed preferred stock of the Trumbull-Cliffs Furnace Co. This compares with a deficit of $58,682 in the first quarter of 1934. Republic's showing for the first quarter is:

Net gain from operations (including profit on sale of securities $125,295.90) after deducting charges for maintenance and repairs of plants, amounting to $2,768,245.66	$4,857,743.06
Less: Interest on indebtedness	760,451.47
	$4,097,291.59
Less: Provision for depreciation of manufacturing plants, and for exhaustion of minerals and mining equipment	1,976,414.91
Profit from operations	$2,120,876.68
Preferred dividends paid on guaranteed stock of Trumbull-Cliffs Furnace Co., less discount on stock purchased for retirement ($7,026.10)	52,811.90
Net profit before federal income tax	$2,068,064.78
Provision for federal income tax—Estimated	233,829.73
Net profit for quarter	$1,834,235.05

Incidentally, Republic has proposed a co-operative group insurance plan to all employes, provisions being made for group life insurance and weekly sick and accident benefits based on employes' earnings.

SHEET & TUBE REDUCES LOSS TO ONE THIRD OF LAST YEAR

Youngstown Sheet & Tube Co., Youngstown, O., lost $595,769 in the first quarter, after charges, against a deficit of $1,423,469 in the comparable quarter a year ago and $920,152 in the last quarter of 1934.

Current additions to productive equipment, including the new wide sheet-strip mill (pp. 42, 43), will enable the company to obtain a larger share of automobile business, said H. G. Dalton, chairman, at the annual meeting. The company also is completing facilities for making electrically-welded pipe, mechanical tubing, conduit and other specialties.

Until means can be found for increasing demand for durable goods, steel required by this portion of industry will be in a slack market, said Mr. Dalton. Lack of confidence by the people still constitutes the greatest bar to improvement, he maintained.

The following were elected directors of Sheet & Tube:

Mr. Dalton, George C. Brainard, Chester K. Brooks, John W. Ford, Frank Purnell, John L. Severance, R. C. Steese, John Tod, Fred Tod, W. E. Meub, and J. C. Argetsinger. The latter two succeed S. Livingston Mather and George T. Bishop, of Cleveland, named in the government's suit alleging interlocking directorates of certain steel companies.

Messrs. Dalton, Purnell, Steese and John Tod were made members of the executive committee.

Sheet & Tube's first quarter showing follows:

Gross income after deducting charges for repairs and maintenance of plants, and provision for estimated federal income taxes	$2,109,389.64
Deduct—Interest for quarter	1,070,331.84
Profit before miscellaneous charges and depreciation and depletion	$1,039,057.80
Deduct miscellaneous charges including expense of carrying and upkeep of idle plants, mines and other properties	293,869.77
Profit before depreciation and depletion	$ 745,188.03
Depreciation and depletion	1,340,957.90
Loss for quarter	$ 595,769.91

J. & L. PARES ITS DEFICIT

Jones & Laughlin Steel Corp., Pittsburgh, reports net loss of $794,789 in the first quarter, compared with net loss of $806,173 in the fourth quarter, and loss of $1,924,524 in the first quarter of 1934.

In the three months ended March 31, 1935, total earnings after deducting all expenses were $499,389. Charges of $1,213,215 for depreciation and depletion and $80,963 for bond interest, converted an operating profit into total loss of $794,789. No preferred dividends were declared, making the arrearage to date $17.75 per share.

WHEELING NET IS $934,571

Wheeling Steel Corp., Wheeling, W. Va., reports net profit of $934,571 in the first quarter, which after all charges, including 6 per cent preferred stock on which there is an accumulation of unpaid dividends, is equal to 93 cents a share on the common stock. This compares with net loss of $58,333 in the March quarter of 1934.

LUDLUM PROFIT GAINS 35%

Ludlum Steel Co., Watervliet, N. Y., shows net profit of $230,157 before federal income tax but after charges. This is an increase of 35 per cent over the profit of $170,235 in the comparable period of 1934. First quarter sales totaled $1,614,531, up 64 per cent over the fourth quarter and 23 per cent over the first quarter of 1934.

UNITED INCREASES DIVIDEND

United Engineering & Foundry Co., Pittsburgh, stockholders meeting annually at Pittsburgh, April 23, re-elected officers and directors,

(*Please turn to Page* 74)

New Pittsburgh Address

Pittsburgh headquarters of STEEL and other Penton publications are now located at 1650 Koppers building. The telephone is unchanged at Atlantic 3212.

WINDOWS OF WASHINGTON

WASHINGTON

LAST week this department's rival and contemporary—Mirrors of Motordom—sang the praises of Detroit as a rest cure for depression-broken business men. It painted an enticing picture of the return of the 1929 level in automobile production, reported the omnipresent evidences of bustling activity, noted the almost complete dispersion of gloom. Go to Detroit and renew your faith in America!

But much as Windows of Washington regrets to say it, this viewpoint of Mirrors of Motordom was purely provincial. Granting that all that the latter claimed for Detroit was accurate, granting even that it may have been guilty of understatement, the truth is that Detroit pales alongside Washington. There is the place for dejected business men to go; there is the pick-me-up of the nation.

Easter Fever at New High

True, ever since the advent of the new deal in March, 1933, Washington has been animated. Except for more automobiles and fewer officers on the streets, the capital has even been reminiscent of war times. But underneath it all was a tense seriousness; for most visitors their contacts with NRA, AAA and other alphabetical phases of the new deal meant life or death for their businesses.

Last week, however, all restraint was thrown off, and apparently recovery came for the nation as well as Washington. Last week was Easter week, and as it goes so goes business. Easter week is to business generally what the groundhog or the direction of the wind at an equinox or the coloring of caterpillars in the fall is to a weather fan.

The mercury of visitors went clear through the top last week, breaking all records, and the glow has revived the spirits even of the new dealers —with several exceptions which will be noted later. When visitors flock to the capital as they did last week, when parents send children in droves for a spring vacation in Washington, then indeed the depression must be over.

By rail, bus, highway and plane they came last week, setting new highs in all forms of transportation. Even upper berths on Pullmans were occupied. For several nights, persons were compelled to go the 40 miles to Baltimore to find hotel accommodations. With the connivance of police, "no parking" signs became dead letters. Incidentally, hotel and food prices are fully up to 1926 levels, marking at least one achievement for the President.

Egg Rolling in Big Way

Into the south grounds of the White House on Easter Monday exactly 51,391 persons were clocked in for the annual Easter egg rolling—another record. Never in the palmiest days of prosperity did so many people tramp through the low floors of the White House; never were the queues at entrances to the senate and house galleries so long. Capitol guides and sightseeing bus attendants now are prime prospects for bond and life insurance salesmen.

In this holiday atmosphere it was natural that the administration should imbibe some of the good feeling. The President was almost gay last week in detailing his plans for expending four billions for work relief—he insists the fifth billion is for direct relief and should not be counted. Even Secretary Perkins had regained some of her former verve.

Confidence exuded all over. In regard to the President it may be said that while his face is grayer and more deeply lined than a year ago, he gives every indication of good health and high spirits.

Go anywhere within the new deal and observe that recovery had arrived at last, and the average new dealer beamed on you. But at the same time he was as sensitive as Ben Bolt, and add to your observation the weasel phrase, "despite what the government has done," and the argument was on.

While conceding that there is a measure of self-recuperation in the present situation, new dealers are deeply pained at what they term the ingratitude of the country. Such manifestations as the record Easter season in Washington, they maintain, are the direct sequel to the billions the government has poured out.

And the new dealers also are deeply grieved at the universal reports that affection for the administration is waning in proportion to the measure of recovery that is expressed. General Johnson brought back some alarming reports recently, and is urging the Democratic national committee to "borrow" some Washington correspondents to tour the country and sound out sentiment.

Take it from an observer of Washington for the past two years, the present confidence in the recovery of business appears genuine. There is much quiet talk that the country is now on the verge of a tremendous upswing. The Easter season was only one crater that broke through the crust.

Sees Boom for Steel

For example, there is a government economist who has been skeptical of much that the new deal has done. He has feared the encroachment of state socialism. He daily expects the first stages of inflation to develop, which will be a sharp increase in demand for and prices of commodities. From the debasement of currency which marked the last stages of the German inflation he contends "we are miles away."

This economist believes this good situation is developing regardless of NRA, its continuation or termina-

tion. He looks for a big market for steel shortly. A good many here expect all code price control to be abandoned, for steel to experience a short period of ruthless price cutting, followed by a strong recovery both in demand and prices.

It is surprising how visitors concede that, after all, some good has been accomplished in the past two years. Many admit that the securities control act has achieved a needed reformation of stock exchange practice. While the Wheeler-Rayburn utilities bill is generally regarded as iniquitous, nevertheless many are frank about abuses needing correction. Would steel producers willingly give up their code?

It is also astounding to new dealers to learn how seriously Huey Long and Father Coughlin are being taken. This is one of the reservations referred to on page 15. Many people coming into Washington are saying that Louisiana has good roads, good schools and a sound financial position, showing that after all there may be some good in Huey. Incidentally, by hinting at the secession of Louisiana and denouncing Ickes, Farley, etc., Huey last week put on a good show for the galleries.

Not Enough Room in Capital

But reverting to Detroit and its claims for returned prosperity—it is not in it with Washington. This city is so short of houses that 94 machinists at the navy yard have to commute from Baltimore. A large speculative builder has just started to build 64 houses here. Carpenters, brick masons and other building tradesmen are being welcomed here —provided they tear up their union cards on crossing the District line.

Rush hour traffic in Washington equals that of Detroit and Cleveland combined. Speaking of it taking pull to get into the Detroit Athletic club, any applicant achieving membership in the swank Chevy Chase club, with full golf privileges, inside three and one-half years is a meteor. It is on Washington that the sunshine of prosperity is shining.

Even as the garden of Eden had its snake, so there are some who scoff at Washington's show of prosperity and disparage the capital as the kept woman of the nation. It is true that the exterior of a house seldom affords a clue to its inhabitants, but certainly Washington's exterior is glistering these days.

GROUSE OVER BASING POINTS, BUT NOTHING DOING NOW

A number of complaints are being received at Blue Eagle headquarters from various parts of the country in connection with the steel basing point.

There is nothing that body can do about the basing point situation at this time. Reports of NRA and the trade commission have been before the President for some weeks and no action has been taken by him; it might be said that none is expected.

In view of the fact that the two reports did not agree it is generally believed here that the reports will be allowed to stay in their present pigeon holes until the NRA extension law has been passed, when it is believed all codes will have to be rewritten.

At that time, say those who think they know, the basing point situation will come up in earnest and those opposed to it will make a determined effort to have it omitted from any steel code that becomes effective.

RICHBERG BECOMES FULL TIME NRA EXECUTIVE AGAIN

There is considerable speculation hereabouts as to just what has happened to Donald Richberg—whether he is still going to be the Big Poo-Bah or whether he has been definitely pigeonholed and ditched.

This comes about from the fact that President Roosevelt has announced that Frank C. Walker, former treasurer of the democratic national committee, again becomes executive director of the national emergency council (p. 10).

Mr. Walker was director of this council before, being succeeded by Mr. Richberg. As the official story goes, Mr. Richberg left the emergency council this time so he could devote his entire attention to NRA and to the poultry case pending before the United States Supreme Court, which will test the constitutionality of the NRA act.

The other side of this picture is the statement which Mr. Richberg has made openly at recent press conferences—namely, that he does not want to remain as acting head of NRA after June 16. Of course the President may change his mind for him. Some are of the opinion that Mr. Richberg is going to head up the whole NRA setup after June 16.

WAGNER, 30-HOUR, GUFFEY BILLS NOT LIKELY TO PASS

The iron and steel industry, with other industries of the country, has shown particular interest at this session of congress in the Wagner labor disputes bill, the 30 hour week bill, and the Guffey bituminous coal bill.

It should therefore be of interest to know that the consensus of opinion here is that while one or all of these bills may pass one house of congress there is practically no chance that any one of them can possibly become law at this session.

There is a feeling among "the knowing ones" that the disputes bill and the 30-hour week bill are being held for their nuisance value on the NRA bill and for no other purpose.

Also, there are some who are of the opinion that portions of these two bills may be inserted in the proposed new NRA legislation on its passage through the two bodies of congress. There are comparable bills to all three of these bills in the house but on the coal bill for instance, the introducer has practically admitted that he hasn't even read the bill.

Insofar as the Guffey bill is concerned, the senator had a conference with the President last week with the avowed purpose of getting the support of the latter for his bill.

Inasmuch as he refused to comment on his conference when he emerged from the executive offices it was assumed that he did not succeed very well—because if he could have come out and stated he had the endorsement of the administration his way would have been easier.

WITHEROW MAY GO ON PERMANENT STAFF OF NRA

W. P. Witherow, Pittsburgh steel manufacturer, is saying little but sawing plenty of wood now as a member of the national industrial recovery board.

There is a feeling in many quarters that Mr. Witherow's attitude and the effectiveness of his work between now and June 16 will determine whether he will be a member of the permanent NRA setup when the law is extended—which is quite generally believed will be done.

Incidently, a poll was taken last week on Capitol Hill among members of the committees dealing with this legislation and there was an overwhelming majority in favor of extending NRA's life. Of course, there is difference of opinion as to just how that shall be done.

CHAMBER AND LABOR MEET ON OPPOSITE SIDES OF FENCE

Strangely enough, meetings of two opposite points of view are to be held in Washington beginning April 29. The annual meeting of the chamber of commerce of the United States begins on that date and a meeting of labor leaders has been called by William Green, A. F. of L. president.

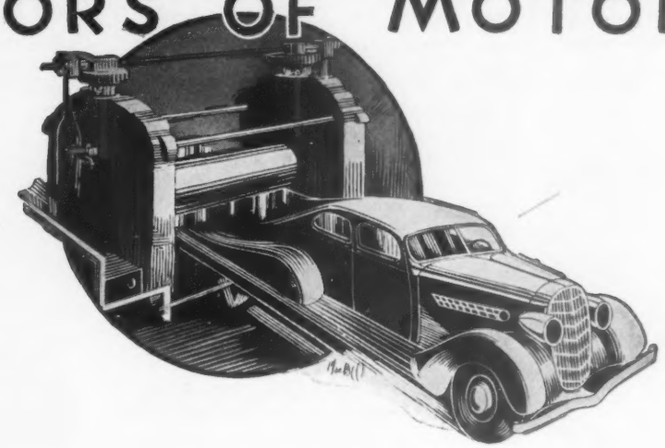
The former will doubtless pass resolutions opposing the passage of the Wagner labor disputes bill and the 30-hour week bill, while the labor leaders' avowed purpose is to push that very legislation.

Mr. Green called into the session all international unions, state federations and city central bodies.

"Labor," he said in his call, "must meet this opposition by concentrating its efforts, by speaking collectively here in the capital city, by mobilizing the full and complete support of labor and all its friends."

The labor delegates were asked to attend a rally and then call on their senators and representatives in behalf of these bills and other which are being backed by the A. F. of L.

MIRRORS OF MOTORDOM



DETROIT

ENGINE speeds, like production figures, are going up. Years ago, 2400 revolutions per minute was top; now they have "revved" up to 4000, with many engineers visioning the day not far distant—possibly 1939 or 1940—when 5000 revolutions per minute will be common. These figures represent speeds at which peak horsepower is developed.

But increasing engine speeds will not be as easy as it has been from now on. Some practices almost universal today will have to be eliminated; some laboratory ideas will come into general use. And along with the development will come changes in clutch and transmission design.

Lighter reciprocating parts, higher compressions, better distribution of fuel, improved combustion chamber design, and generally better breathing characteristics of the engine will have to be worked out. New metals and new alloys will be of major assistance to engine builders in coming years.

WORK ON ROTARY VALVES

The matter of breathing characteristics involves not only the design of intake and exhaust passages but also improved valve timing, particularly the opening and closing of valves and a longer period of maximum opening. In working out a solution to the valve problem, some authorities foresee the demise of the poppet-valve engine and in its stead a system of rotary valves.

Two leading engine specialists are reported at the moment to have designs of power plants incorporating a newly-developed rotary or tubular style valve. Previous systems of this sort have been beset by certain ills such as overheating, warping and improper distribution. Joseph A. Anglada, consulting automotive engineer, has been active for several years in perfecting design of rotary valves to overcome these troubles.

A Ford V-8 engine recently was revamped for racetrack operation, and by the use of a specially shaped aluminum head designed by Bohn Aluminum engineers, as well as certain other revisions, power was pushed up to 150 horsepower and speed up over 5000 revolutions per minute without trouble.

While this engine was satisfactory for racing work, it was not suitable for ordinary passenger car service. Steep cams were used to increase valve opening and power. Probably with a suitable rotary valve system, this engine would have performed equally well in either racing or normal operation. Rotary valves also are much quieter in operation.

Improved piston designs, aluminum connecting rods, heavier crankshafts, the new cadmium-silver and copper-lead bearings, all are mentioned as developments which will aid in the effort to boost engine speeds.

Nash has used aluminum connecting rods with success in attempts to minimize further possibilities of bearing troubles. Alloy cast irons and alloy steels are both being used to advantage in slashing weight per horsepower of engines.

But engine specialists have plenty of room for future advancement when it is realized that only about 8 per cent of the heat units available in a given quantity of gasoline is used in moving the car. The rest is lost—in the cooling water, in the exhaust pipe, in friction of all moving parts, in operating accessories and in overcoming road and air friction. Thus, when you buy a gallon of gasoline, remember that only about 2/3 of one pint is being consumed in moving you toward your destination.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,765
Feb.	105,447	230,256	340,544
Mar.	115,272	338,434	429,830
3 mo.	349,544	724,356	1,063,139
Apr.	176,432	352,975	.....
May	214,411	330,455	.....
June	249,727	306,477	.....
July	229,357	264,933	.....
Aug.	232,855	234,811	.....
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

Estimated by *Cram's Reports*

Week ended:

April 6	107,895
April 13	109,337
April 20	110,235
April 27	110,970

JUST as it requires only one match to start a prairie fire, so the strike tie-up in Chevrolet's transmission plant at Toledo might set off a general automobile strike, but Detroit scarcely believes this to be possible.

Toledo shares with Cleveland an unenviable situation in regard to labor, and the present strike apparently reflects strong local organization efforts. General Motors has offered to meet all conditions except a closed shop, and it is safe to predict that on this issue General Motors never will give in.

BOTTLENECK ON PARTS?

The practical effect is to pinch off an important parts division. While Chevrelet has banks of transmissions estimated at upward of 50,000, it faces a stoppage about the second week of May unless work is resumed at Toledo shortly. Recent threats of labor troubles at the Fisher Body plant in Cleveland have resulted in a

diversification which eliminates Cleveland as a bottleneck. It can be forecast that efforts will be made to eliminate the dependence upon Toledo for transmissions.

Chevrolet production last week was unaffected by the strike and approximated 30,000 units. It was Chevrolet that enabled General Motors to reach a total production of 40,125 units latst week—a new seasonal high.

Ford also crossed 40,000 units last week by a narrow margin, assembling over 6600 units daily. Incidentally, the 500,000th V-8 for 1935 came off the assembly line at the Rouge plant last Monday; this does not include the 36,000 Fords assembled last November and December.

Chrysler held at 19,775 last week. For all makers, last week production was 110,970 units, still the highest since late August, 1929.

REPRESENTATIVES of W. C. Durant and John J. Raskob, both at one time big names in General Motors, last week inspected the former Franklin plant in Syracuse, N. Y., reputedly with a view to launching a new automobile enterprise . . . . Continental Motors Corp., Detroit, has been awarded the contract for a 90-horsepower, 6-cylinder, radial, air-cooled engine for the small low-priced airplane which the bureau of air commerce of the department of commerce is bringing out. It will be a 2-cycle engine, only 20 inches in diameter . . . Champion Spark Plug Co., Toledo, O., challenges a recent statement that another manufacturer of spark plugs has been making heavy shipments recently to Ford; Champion maintains that it has been Ford's sole source of supply since 1911; it is running at peak production not only on Ford requirements but also on releases from other builders.

Died:

DANIEL J. WHALEN, 56, pioneer builder of steel freight cars and for the past four years general manager of the Canton, O., plant of Pullman Standard Car & Mfg. Co., in Canton, April 17. Born in Pittsburgh in 1879, he was associated with the late John M. Hansen in the construction of the first all-steel freight car built. For almost 25 years he was general manager of the American Car & Foundry Co. Later, he was associated with the Pressed Steel Car Co., Pittsburgh. Many developments in railroad material uses were credited to him, including the construction of the first all-aluminum freight car.

♦ ♦ ♦

Charles H. Lay, 81, treasurer of the National Transit Co., Oil City, Pa., April 19.

♦ ♦ ♦

William McLean, 67, president of the Dunbar Corp., Dunbar, Pa., in Germantown, Pa., recently.

♦ ♦ ♦

Thomas L. Breen, 57, steel inspector with the Moody Engineering Co., Martinsburg, W. Va., April 23.

♦ ♦ ♦

Lynn S. Pease, 75, president of the Clum Mfg. Co., Milwaukee, metal stampings, hardware, automobile locks, etc., April 19.

♦ ♦ ♦

George G. Britton, 48, president of the Interstate Roofing Co. and treasurer of the Interstate Foundry Co., Anniston, Ala., in that city, April 23.

♦ ♦ ♦

Edwin R. Beeman, 64, president of the Beeman Door Control Co., Minneapolis, in that city, April 19. He was founder and former president of the Beeman Tractor Co., Minneapolis, and was one of the founders of Nome, Alaska.

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Frederick L. Pierce, 74, widely known Milwaukee industrialist, in Milwaukee, April 16. With Frank R. Bacon he organized what is now Cutler-Hammer Inc., and after serving many years as treasurer became vice president several years ago.

Figure in Changes in Carnegie General Sales Department

James P. Kessler Jr.

Merle N. Smith

Walter J. Weldin

JAMES P. KESSLER JR., who has been in direct charge of the scheduling of all rolled products of the Carnegie Steel Co., Pittsburgh, since 1900, retired April 26. He has an enviable service record of over 50 years and is a holder of a Gary Gold Service medal. Merle N. Smith and Walter J. Weldin will take over Mr. Kessler's responsibilities as managers of the production division and order detail division, respectively, of the general sales department. Mr. Smith has been identified with Carnegie since 1895, having spent all his time in production and scheduling activities. Mr. Weldin has come up through the general sales department and has managed the order detail department, under supervision of Mr. Kessler, since its inception.

Industrial Men in the Day's News

William B. Todd and Frederick E. Fieger, New Vice Presidents and Directors, Jones & Laughlin Steel Corp.

William B. Todd

Mr. Todd (left) has been general manager of sales for the past four years, has been in the steel industry since 1901.

Mr. Fieger (right) has directed manufacturing operations since 1929, has been associated with the company from 1917.

Frederick E. Fieger

WILLIAM B. TODD has been elected vice president in charge of sales and a director of Jones & Laughlin Steel Corp., Pittsburgh. He has been general manager of sales for the company since 1931.

His 34-year business career has been centered in the Pittsburgh district. Born in Beaver Falls, Pa., he attended public schools there and was graduated from Geneva college, Beaver Falls, in 1901. In that year he became affiliated with the Union Drawn Steel Co., then with headquarters in Beaver Falls. Over the following 17 years he served in various departments of the company, and in 1918 was appointed vice president. The rapid growth of Union Drawn Steel, witnessed mainly in these years, lent him broad experience in the cold-finished steel bar industry.

In 1922, four years later, after becoming vice president, he left Union Drawn Steel and became manager of sales of the cold-finished division for Jones & Laughlin. He held this position until 1930, when he was named assistant manager of sales, and early in 1931 he succeeded Clinton S. Bradley as general manager of sales.

FREDERICK E. FIEGER has been elected vice president in charge of manufacturing operations for Jones & Laughlin. He likewise has been made a director and a member of the executive committee.

He has been general manager in charge of manufacturing operations since 1929, and dates his affiliation with the company from 1917. At the latter time he went with Jones & Laughlin as superintendent of the wire department at the Aliquippa Pa., works, and in 1918 was appointed superintendent of the steelworks.

He was made assistant superintendent at Aliquippa in 1920; general superintendent of the company in 1923, and assistant general manager of the corporation in January, 1928. In October, 1929, he was appointed general manager in charge of all manufacturing operations.

Election of both Mr. Todd and Mr. Fieger to the directorate of the company follows the action of the stockholders at the company's annual meeting, April 23, in approving the increase in number of directors from 15 to 17. The election of both Mr. Todd and Mr. Fieger to vice presidency increases the number of officers with that title in the company to six. Other vice presidents are: W. C. Moreland, B. F. Jones III, W. J. Creighton and A. B. Shepherd.

DWIGHT CLARK, treasurer of the Phillips Properties Inc., Washington, has been elected a director of Jones & Laughlin. His election fills a vacancy caused by the retirement of George Gordon Crawford, former president.

James C. Foster, manager of wire sales for Jones & Laughlin, has been appointed general manager of sales.

A. W. Herron, junior Cincinnati sales manager for the corporation, succeeds Mr. Foster as manager of the wire department. M. M. Harper has been named Cincinnati district sales manager.

CLIFFORD R. FOX, for the past five years in charge of the blooming mill, bar and 60-inch hot strip mills at the Steubenville, O., plant of Wheeling Steel Corp., has been appointed superintendent of the new wide hot strip mill of Bethlehem Steel Corp. at Lackawanna (Buffalo), N. Y. Previous associations include the National Tube Co., Lorain, O.; Youngstown Sheet & Tube Co., Youngstown, O.; Corrigan, McKinney Steel Co., Cleveland; and Weirton Steel Co., Weirton, W. Va. He is now superintending construction of the new mill at Lackawanna.

♦ ♦ ♦

F. R. Miller has been elected vice president in charge of sales of the Consolidated Expanded Metal Cos., Wheeling, W. Va., subsidiary of the Wheeling Steel Corp. He has been associated with the Consolidated organization in various sales capacities for the past 12 years, prior to that being connected with General Fireproofing Co., Youngstown, O.

♦ ♦ ♦

K. B. McEachron, research engineer, General Electric Co., Pittsfield,

Mass., whose studies in artificial lightning up to 10,000,000 volts have brought him worldwide recognition, will receive the Edward Longstreth medal of the Franklin institute, Philadelphia, May 15. The award is based on his contribution of thyrite, a substance used in more than 35 different electric applications, principally for lightning arresters.

♦ ♦ ♦

A. G. Overton, superintendent of the Tarrant plant of the Alabama By-Products Corp., Birmingham, Ala., has been elected president of the Alabama Academy of Science.

♦ ♦ ♦

R. G. Harry has been appointed New York district sales manager for the Wrought Iron Co., Lebanon, Pa. The New York office of the company has been moved to 90 West street.

♦ ♦ ♦

Winthrop W. Aldrich, H. B. Rust and Samuel M. Vauclain have been re-elected directors of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. John L. Hall, Boston lawyer, has been added to the directorate.

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John H. Mohr, John Mohr & Sons, Chicago, has been elected first vice president of the Chicago Purchasing Agents association.

Frederick J. Heaslip, Fairbanks, Morse & Co., has been elected secretary of the purchasing agents group.

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Paul B. Allen, for 12 years district sales manager at Detroit for the Otis Steel Co., Cleveland, has been named general manager of sales at Cleveland, succeeding J. G. Carruthers, who will continue as vice president directing sales.

♦ ♦ ♦

C. D. Hastings has been elected a director of the Murray Corp. of America, Detroit, succeeding E. A. Potter Jr. Other directors have been re-elected.

♦ ♦ ♦

Howard F. Graff, until recently research assistant for W. P. Sykes at the Cleveland Wire Works, General Electric Co., has been appointed to the research staff of Universal Steel Co., Bridgeville, Pa.

♦ ♦ ♦

Lawrence J. Kline has been elected vice president of the Mercury Mfg. Co., Chicago, industrial tractors and trucks. He will continue as general manager, a position he has held for the past seven years. He joined the company in 1919 as sales engineer.

♦ ♦ ♦

R. Y. MacIntyre, representative in Memphis, Tenn., for the Link-Belt Co., Chicago, since 1932, has been transferred to the company's district sales office and warehouse at Dallas, Tex., where he will assist E. G. Wendell, Dallas manager.

♦ ♦ ♦

D. D. Trimble, sales engineer and recently superintendent of the welding division of J. D. Adams Co., Indianapolis, has opened offices for the company at 207 Investment building, Pittsburgh. Complete stock of equipment will be carried, supplying western Pennsylvania, eastern Ohio and West Virginia.

♦ ♦ ♦

E. A. Reike has been appointed contracting manager for the St. Louis district with headquarters in St. Louis for the American Bridge Co., Pittsburgh. He has been affiliated with American Bridge for his entire business career of over 25 years and previously was assistant to the late E. E. Green, former contracting manager.

♦ ♦ ♦

J. C. Goff, Pittsburgh manager of the Scully Steel Products Co., has been elected president of the Pittsburgh chapter of the American Steel Warehouse association.

T. A. Harper, Edgar T. Ward's Sons Co., is secretary-treasurer. J. M. Hilbisch, Jones & Laughlin Steel Corp., will represent the chapter on the national board of directors of the association.

♦ ♦ ♦

Emile Ramas has been elected president of the Association Technique de Fonderie, Paris, France. He is managing director of Societe Francaise Metallurgique "Griffin" and professor at the high school of foundry in Paris. M. Ramas was president of the association from 1918 to 1926, and has been honorary president since that time.

Convention Calendar

April 29-May 1—Concrete Reinforcing Steel institute. Eleventh annual convention at Homestead hotel, Hot Springs, Va. R. W. Johnson, 201 North Wells street, Chicago, is secretary.

May 14—Machinery and Allied Products institute. Annual meeting at Hotel Cleveland, Cleveland. Alexander Konkle, 221 North LaSalle street, Chicago, is assistant secretary.

May 14-15—American Gear Manufacturers association. Annual meeting at Penn-Lincoln hotel, Wilkinsburg, Pa. J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

May 14-16—American Steel Warehouse association. Twenty-sixth annual convention at Edgewater Beach hotel, Chicago. Walter S. Doxsey, 442 Terminal Tower, Cleveland, is secretary.

May 15-16—National Metal Trades association. Convention and exhibit in Cleveland. Harvey S. Flynn, 122 South Michigan avenue, Chicago, is secretary.

May 19-23—National Electrical Manufacturers' association. Spring meeting at Homestead hotel, Hot Springs, Va. R. J. Blais, 155 East Forty-fourth street, New York, is secretary.

May 20-23—National Associaton of Purchasing Agents. Annual convention and exhibit at Waldorf-Astoria hotel, New York. George A. Renard, 11 Park Place, New York, is secretary.

May 22—Porcelain Enamel institute. Annual meeting at Statler hotel, Cleveland. Kurt R. Groener, 612 North Michigan avenue, Chicago, is executive secretary.

May 23—American Iron and Steel institute. Spring meeting at Hotel Commodore, New York. Walter S. Tower, 350 Fifth avenue, New York, is executive secretary.

May 24—American Society for Metals. Special sectional meeting of New York, Philadelphia, New Jersey and Lehigh Valley chapters at Hotel Pennsylvania, New York. T. N. Holden, 1219 Glenwood road, Brooklyn, N. Y., is secretary at New York.

June 6-7—Gray Iron Founders' society. Meeting at Hotel Gibson, Cincinnati. Henry M. Halsted Jr., Public Square building, Cleveland, is executive vice president.

June 10-13—American Electro-Platers' society. Annual meeting at Stratfield hotel, Bridgeport, Conn. H. A. Gilbertson, 234 South Wabash avenue, Chicago, is secretary.

June 24-28—American Society for Testing Materials. Thirty-eighth annual meeting at Book-Cadillac hotel, Detroit. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

Aug. 19-23—American Foundrymen's association. Thirty-ninth annual convention at Royal York hotel, Toronto, Ont. C. E. Hoyt, 222 West Adams street, Chicago is secretary.

Sept. 11-21—National Machine Tool Congress (Third). In Cleveland, under auspices of the National Machine Tool Builders' association; Machine Shop Practice division, American Society of Mechanical Engineers; and Production Activity division, Society of Automotive Engineers. Herman H. Lind, 1220 Guarantee-Title building, Cleveland, is general manager. National Machine Tool Builders' association.

Sept. 11-21—National Machine Tool Exposition (Third). In Public Auditorium, Cleveland, under auspices of the National Machine Tool Builders' association. Roberts Everett Associates, 225 West Thirty-fourth street, are managers.

Sept. 24-26—Association of Iron and Steel Electrical Engineers. Annual convention and exposition in Pittsburgh. T. B. Little, Empire building, Pittsburgh, is acting managing director.

Sept. 30-Oct. 4—American Institute of Mining and Metallurgical Engineers. Fall meetings of Iron and Steel and Institute of Metals divisions in Chicago. John T. Breunich, 29 West Thirty-ninth street, New York, is assistant secretary.

Sept. 30-Oct. 4—American Society for Metals. Seventeenth annual National Metal congress at Palmer House, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Sept. 30-Oct. 4—American Welding society. Fall meeting in Chicago. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Sept. 30-Oct. 4—National Metal exposition. Seventeenth annual, in International Amphitheater, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is general manager.

EDITORIAL

How Convert Unemployed Into Capable Workmen?

REPORTS from sections of the country where industrial activity is being maintained at a high rate indicate that jobs for certain types of workmen are going begging. This actual shortage seems surprising because the relief rolls in these localities, while reduced somewhat in recent weeks, still are high.

What is the explanation of this paradox? Why do jobs remain unfilled when so many thousands of persons are looking for work? What steps must be taken to remedy this unhealthy situation?

Scores of answers to these questions have been presented in the voluminous literature on current unemployment problems, but thus far no great attention seems to have been given to what probably is the basic factor in the situation. We seem to have overlooked the fact that as a nation we have steadily raised the standards of jobs without doing anything to develop or train the prospective applicants so that they can measure up to the more exacting requirements of the future.

This process has been going on for a long time. It received a strong impetus after the World war, and has been developing with increasing rapidity since the early postwar period. Under the new deal, the minimum wage and maximum hour provisions of NRA were supposed to help the "forgotten" man, who presumably was the unemployed worker.

Mediocre Workman Finds It More Difficult Than Ever to Obtain Employment

Now we are beginning to see that NRA may have helped some of the employes who already had jobs, and it probably enabled many unemployed to obtain more regular work, but it certainly did not help the "forgotten" man who—below the average in intelligence, efficiency and initiative—always has had difficulty in holding a job even when times were good. NRA was a cruel blow to the mediocre workman; it made it almost impossible for him to get a job anywhere.

For instance, before NRA almost every industrial establishment carried many employes who were incapable of exacting, hard work. These usually were faithful men, who because of some disability were not able to remain in their former occupations. Rather than dismiss them, their employers kept them at less exacting employment and at lower wages. No one will claim that this was the best possible system to meet this difficult problem, but it was a practical solution under the circumstances then existing.

The provisions of NRA made it more difficult for industrial employers to continue this practice. Higher wages and shorter hours automatically cause the employer to select his employes more carefully. Thus the poorly qualified applicant is worse off than he was under the old system.

On the other hand, the better workers usually are able to take care of themselves under all but the most acute circumstances. One reason that it is so hard to find certain skilled diemakers, automatic machine operators, etc., is that these men had enough resourcefulness and initiative to shift for themselves when the depression wiped out their jobs. Many of them went into business for themselves, some went back to the farms and others took up new occupations in other industries. Probably a majority of these men have established themselves in their new careers and do not care to return to their old trades.

Industry and Government in Position To Plan Rehabilitation of Jobless

Thus industry has lost permanently thousands of its most capable employes. The unfortunate feature of the situation is that to date so little effort has been made to build up new employes to replace those who have transferred their efforts to other fields.

One of the big tasks in the unemployment problem is to convert the hordes of unemployables into employables. Hundreds of thousands of applicants for jobs must be rehabilitated in mind and spirit, as well as physically, before they can qualify as able workers.

Here is one of the most important problems facing the nation today. The government—socially-minded as its leaders claim to be—has not sensed the fundamentals of the real problem. Its policies are making matters worse instead of better for the real unfortunates among the jobless.

Industry should tackle this problem vigorously. Perhaps it can help to start a movement to convert these thousands of unemployables into employables.

THE INDUSTRIAL DIAL

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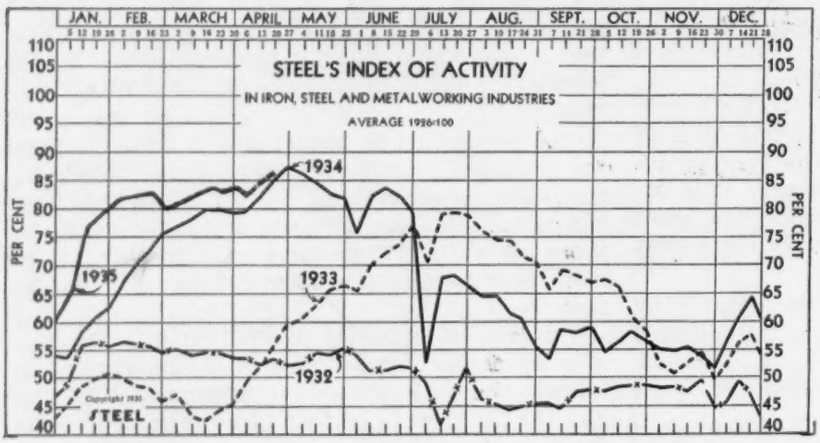


STEEL'S *index of activity in the iron, steel and metalworking industries gained 1.2 points to 86.6 in the week ending April 20:*

Week ending	1935	1934	1933	1932
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	48.4	54.8
Mar 16	84.0	79.9	42.7	54.4
Mar. 23	84.0	79.7	44.6	53.5
Mar. 30	8.3	79.3	45.2	53.4
April 6	83.4	79.6	49.1	52.6
April 13	85.4†	82.2	52.6	53.4
April 20	86.6*	85.0	55.8	52.3

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings power output and auto assemblies each* 20.

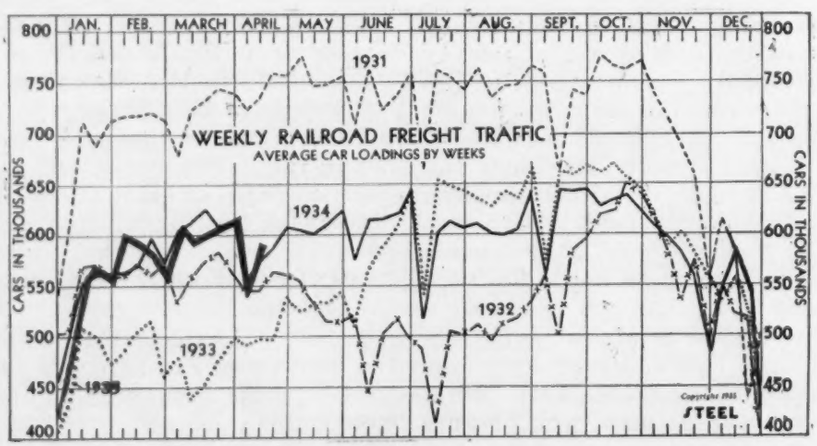
End of Fourth Month Finds Business Tone Stronger

ONE would think that with the various statistics and numerous indexes available it would be easy to determine accurately just where industrial activity stands at any given date. But this does not seem to be true. Right now many well informed persons are convinced that activity was at a higher rate at the end of January than it is today. Many others believe it is higher now than it was then.

This difference in opinion is due to the fact that those who compile indexes employ widely varying formulas in weighing the factors upon which the indexes are based. Also, there is a lack of uniformity in presenting the completed indexes. In some cases the trend lines are corrected for seasonal or other variations. Other authorities do not adjust their indexes for these variations.

Herein lies much of the confusion today. Most of the indexes adjusted for seasonal change show a gradual decline since January. Unadjusted barometers, such as STEEL'S index of activity, show a sharp rise in January and a sidewise movement in February, March and April—with a faintly upward tendency in the last month.

This raises the question of the propriety of adjusting current figures to seasonal changes



1935	
Apr. 13	587,685
Apr. 6	545,627
Mar. 30	617,485
Mar. 23	607,780
Mar. 16	597,432
Mar. 9	587,270
Mar. 2	604,642
Feb. 23	552,896
Feb. 16	581,981
Feb. 9	592,560
Feb. 2	598,164

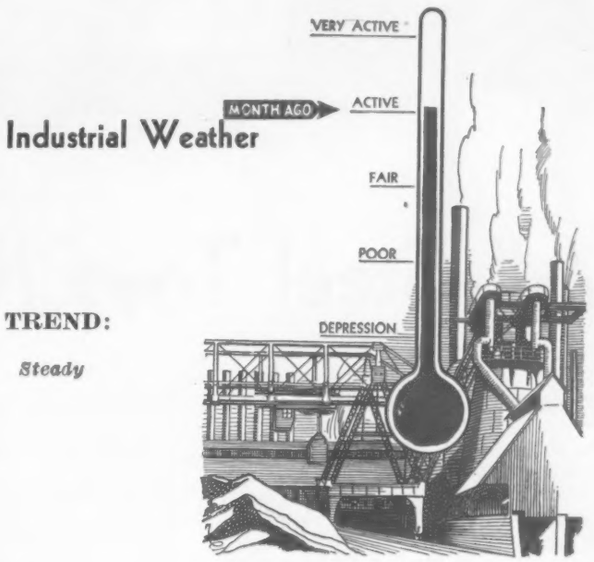
1934	
Apr. 14	578,837
Apr. 7	559,070
Mar. 31	610,190
Mar. 24	610,038
Mar. 17	627,549
Mar. 10	614,120
Mar. 3	605,717
Feb. 24	574,908
Feb. 17	600,268
Feb. 10	573,898
Feb. 3	565,401

established in predepression years. Some activities, such as car loadings, electric power output, and coal production, conform to true seasonal patterns. But steel output, automobile production and many other factors behave quite differently under NRA than they did under the law of supply and demand. Perhaps under present conditions, when so many artificial influences are at work, the unadjusted index is preferable.

Of course no single barometer can hope to satisfy everybody—particularly when the rates of activity in important industries vary as widely as they do today. To a man in Detroit an index number of 80 looks low by 20 points, while to a building contractor it seems too high by 50 points.

Yet the average of all industrial activity, as of April 30, probably is higher than prevailing business sentiment would indicate. The peak in automobile output has been postponed beyond expectations. Steelworks operations again are creeping upward. Freight car loadings in the third week of April registered another heavy gain. Power output, while receding seasonally, seems stabilized at levels well above the 1934 range.

As a result of these movements, STEEL's index—unadjusted for any seasonal change—touched 86.6, which is a new peak in the present drive which started last December.



Where Business Stands

Monthly Average, 1934—100

	Mar., 1935	Feb., 1935	Mar., 1934
Steel Ingot Output	134.0	140.7	127.5
Pig Iron Output	130.4	131.7	119.7
Freight Movement	101.7	98.2	103.2
Building Construction	.....	76.1	116.4
Automobile Output	187.2	147.3	153.7
Wholesale Prices	104.1	105.5	98.4

The Barometer of Business

Industrial Indicators

	March, 1935	Feb., 1935	March, 1934
Pig iron output (daily average, tons)	57,120	57,675	52,438
Machine Tool Index	60.3	61.5	50.9
Finished steel shipments (tons)	668,056	583,137	588,209
Ingot output (daily average, tons)	108,873	114,255	103,600
Dodge Bldg. awards in 37 states (sq. ft.)	.....	9,670,300	14,788,900
Automobile output	451,805	358,658	370,173
Coal output, tons	38,848,000	34,423,000	38,392,000
Business failures; number	976	1,005	1,102
Business failures; liabilities	$18,522,840	$18,737,657	$27,227,511
Cement production, Bbls.	.....	3,053,000	5,257,000
Cotton consumption, bales	.....	478,291	543,690
Car loadings (weekly aver.)	602,922	581,400	611,843

Foreign Trade

	March, 1935	Feb., 1935	March, 1934
Exports	.....	$163,006,000	$190,000,000
Imports	.....	$152,537,000	$158,000,000
Gold exports	.....	$46,000	$44,000,000
Gold imports	.....	$122,817,000	$237,612,000

Financial Indicators

	March, 1935	Feb., 1935	March, 1934
25 Industrial stocks	$139.34	$145.69	$142.56
25 Rail stocks	$22.73	$25.76	$38.99
40 Bonds	$80.58	$82.51	$81.25
Bank clearings (000 omitted)	$22,564,491	$19,040,988	$19,598,162
Commercial paper rate, New York (per cent)	1	1	1¼
*Commercial loans (000 omitted)	$7,609,000	$7,598,000	$4,647,000
Federal Reserve ratio, per cent	72.5	72.4	68.2
†Railroad earnings	$25,719,919	$21,348,557	$29,281,008
Stock sales, New York stock exchange	15,849,017	14,404,225	29,915,969
Bond sales, par value	$311,534,900	$224,268,000	$319,673,300

*Leading member banks Federal Reserve System.
†February, January and February, respectively.

Commodity Prices

	March, 1935	Feb., 1935	March, 1934	Monthly av. 1913
STEEL's composite average of 25 iron and steel prices	$32.46	$32.54	$32.40	$26.32
Bradstreet's index	$9.66	$9.79	$9.16	$9.21
Wheat, cash (bushel)	$1.10	$1.13	$1.05	92c
Corn, cash (bushel)	97c	$1.02	65c	51c
Petroleum, crude (Bbl.)	.....	98c	98c	$2.50

All-Steel Toys Manufactured from

BY A. H. ALLEN
Associate Editor, STEEL

PROVIDING amusement for youngsters with scrap sheet and strip steel from automotive plants, on the face of it, may sound rather strange; but the All Metal Products Co., Wyandotte, Mich., is doing exactly this, consuming an average of 1000 tons of salvage sheet and strip each month.

The company's products comprise a complete line of inexpensive nonmechanized toys, such as wagons, airplanes, automobiles in both passenger and truck models, doll carriages, dust pans, toy vacuum sweepers, shovels and the like. Of all-steel construction, with the exception of rubber tires and wooden wheels on some models, the toys are built to retail at not over 50 cents, many of them being in the 10 and 20-cent price range.

The company is reported to be the second largest manufacturer of low priced toys in the United States, operating two plants in Wyandotte. One is devoted chiefly to the manufacture of toy rifles, water pistols and pop guns; the second is equipped to handle most of the other lines.

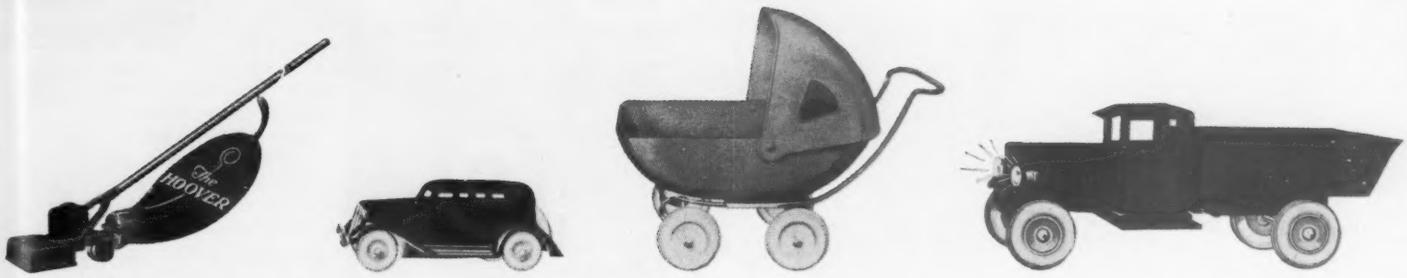
Toy manufacture for years has been a highly seasonal industry, with plants chiefly concerned in meeting rush demands for Christmas trade. This business reaches a peak toward the end of the summer, the result being that it has been to a certain extent unstabilized. Managements have attempted to iron out this irregularity by a number of methods. One is to urge jobbers to stock up at an earlier season; another is to introduce more new models each year to keep demand better sustained. The latest plan centers around efforts to build up an Easter and Fourth of July trade in toys.

Color has lent valuable aid in the latter move. During the Christmas season, toy manufacturers have relied largely upon red and green as standard seasonal colors. Lately, by changing to pastel shades, it has been found possible to interest buyers in such toys as wagons, trucks and the like, for subsequent filling with Easter candies, rabbits and the other trimmings of the spring holiday.

All Metal Products is continually designing new models of toys and the trend in design has followed closely the developments in full-size automobiles, trucks and airplanes. A master model is built up by hand out of sheet steel. From the master model, drawings and templates are made for dies and the necessary die work started. A completely equipped die shop is maintained, with all the necessary equipment for cutting, grinding and assembling die sets required in press operations.

For an ordinary model, only three or four parts are required. Thus only a few die sets are needed for each part—possibly blanking, first

GENERAL view of press department, with piles of sheared stock shown in foreground



Salvage Sheet and Strip

forming and second forming— and on some parts only one forming operation is required. For instance, on one small truck model, about 14 inches in length, only three parts are required—the cab and front fenders, the rear floor and frame and the body box. All parts are assembled by means of small ears locking into holes in mating edges. No welding, riveting or other fastening methods are required.

Dies are of high-carbon steel and give excellent service in this light work. Sheet steel used is 19-20-gage depending upon purchase price, availability, and other factors. As high as 1,000,000 pieces have been obtained on one set of dies, and even then the dies were not worn excessively. Deep draws are avoided usually, this being done by splitting the steel and bending it together. Sheet stock is received in large wired bundles, all pieces being flat. It is unloaded, sorted if necessary and put through a shear, set for cutting uniform widths for a particular blanking operation.

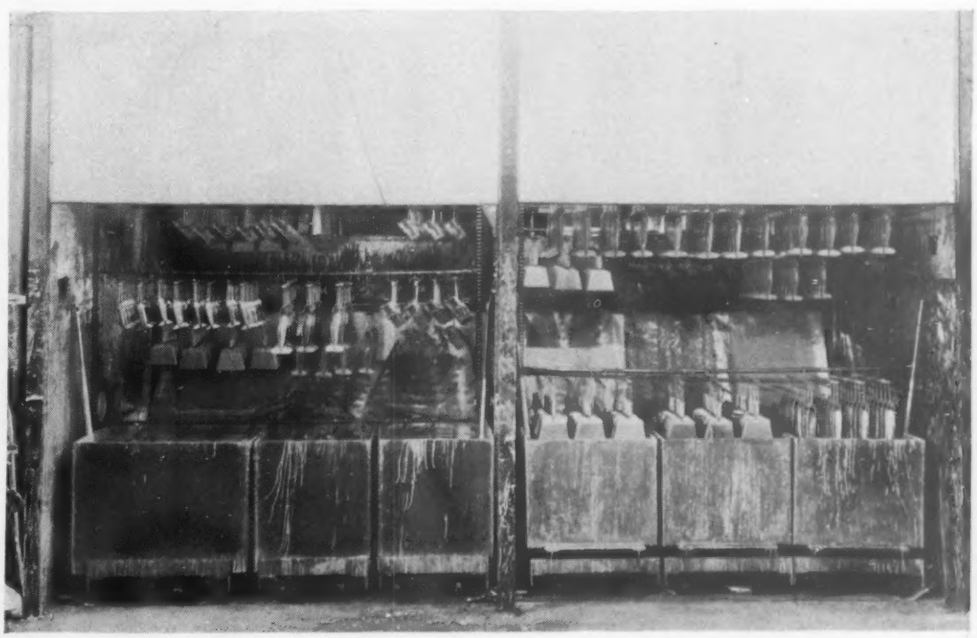
A battery of about 75 presses, some of them inclined and some vertical, handles all necessary forming operations. This equipment is largely AE4½ and AE3½ sizes, with some between these two capacities, products of the Niagara Machine & Tool Works, Buffalo. Presses are driven from direct motor and lineshafts through belts with clutches on each press for starting and stopping.

Safety Device on Presses

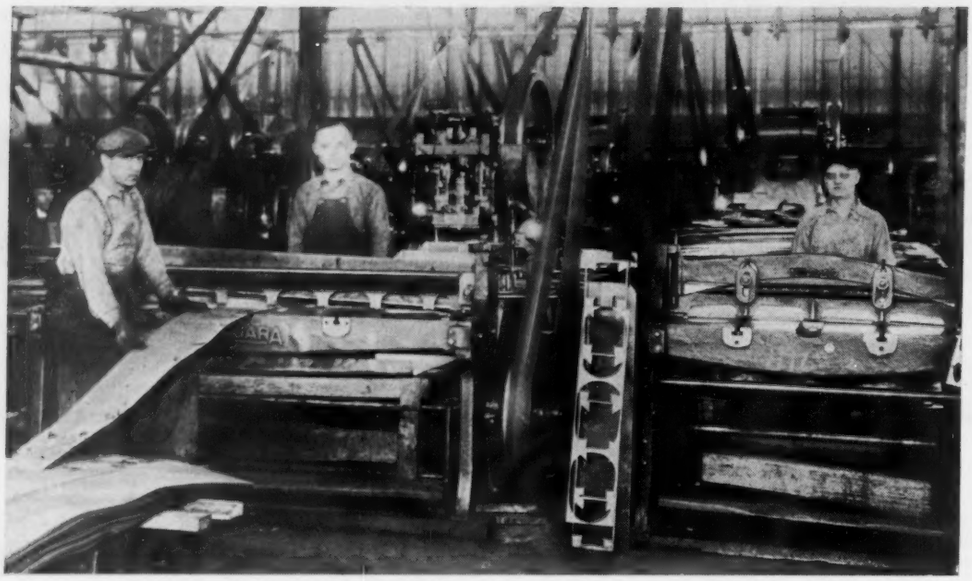
Since speed is essential on this high-production work, extra precautions are taken to protect operators' hands. On the toggle arm of each press at its upper end is attached a rigid bar, extending about 8 inches out from the arm and approximately at right angles to it. As the crank turns, this arm descends and separates the upper ends of two ½-inch steel rods which are crossed and pivoted at a point a few inches below the lowest position of the bar on the toggle. These rods are held by a spring in the closed position, and their lower ends coincide and extend vertically across about the center of the die opening.

In their closed position, the rods allow ample space for the operator to place a piece in the dies and remove a formed part. As the ram descends, these lower ends spread, one to each side and thrust the operator's hands out of the way, if he has not removed them. An illustration on page 27 shows this device. The rods are separated for about two-thirds of the complete stroke of the press, thus effectively preventing accidents from laxity on the part of the operator. The device was designed by engineers of the company and has been installed on all presses. Installation of this one device reduced the accident insurance rate from $3 to $1.10.

Following the various press op-



PARTS hung on rack conveyors are dipped in the six tanks shown in the foreground and are carried up into the baking oven. The tanks contain different color enamels



STOCK of correct size for maximum use in blanking operations is cut on these shears

erations on the parts which enter into the construction of the toys, they are placed in large boxes with wire mesh sides and bottoms and trucked to a vapor degreasing machine. This unit automatically hoists the box of parts up off the floor and lowers it into the degreasing chamber where the active vapor is kept to the proper level to cover the load completely. In the space of a few minutes the load is lifted out and every piece has been cleaned thoroughly and is dry.

Parts which are to receive a black enamel coating are loaded into a cylindrical container which is lowered into a bath of enamel, raised out of the liquid and whirled at a moderate speed to remove excess coating from the parts. By this centrifugal action the coating is spread evenly and any excess is returned to the bath. The container is then removed from this machine and transferred to a conveyor which carries it through a baking oven where the coating is dried. It might be thought that with the pieces piled indiscriminately, one on top of another, in this container, one piece would spot up another where the two came in contact. However, this is not true, and inspection of the pieces as they emerge from the baking oven shows a smooth lustrous black surface, unmarred by contact with adjacent pieces. The secret of this lies in the correct mixture and proper ingredients in the coating material.

A separate unit is operated to dip and bake light colors on other parts of the toys. A large gas-fired oven is arranged with a series of racks about 5 feet apart on an endless conveyor. On each rack are 12 or 15 rows of hooks, each row accommodating a number of identical pieces. The oven is divided lengthwise into two sections, each provided with a separate system of conveyor and racks. At the front is a series of tanks filled with enamel of different colors. These tanks are placed on caster trucks so that they may be changed as desired.

The parts are hung on the racks and slowly moving conveyor lowers its load into the tanks and moves on up into the baking oven. Thus, parts may be coated in as many as three different colors simultaneously. The conveyor moves slowly enough so that most of the drip falls back into the tanks. Baking temperature is 275 degrees Fahr. When the parts reach the other end of the oven they are perfectly dry and are removed from the conveyor and taken to assembly benches.

Several rows of these benches are

BENCHES where various parts of toys are assembled and packed for shipment

required for assembly of the various models in production at any one time. Girls do this work which, in the case of a toy truck, involves such operations as fitting the cab and fenders to the rear floor and frame, bending over the ears which hold the two together, setting on the body and fastening it into place, fitting in the two wire axles with wheels, washers, etc.; turning one end of each axle on a special machine to prevent wheels from coming off; and packaging in cardboard cartons for subsequent shipment.

Follow the Real Thing

The ingenuity shown in designing and assembling many of these toys is notable. Trends of the day in automobiles and trucks are watched closely and as soon as a new body style is introduced in the automotive field, work is started on duplicating or approximating the design in a new toy. Children are always eager to have toys which conform to the "real thing" in appearance. Recently the trend has been toward putting skirts or valances on fenders, both in the airplane and automobile fields; immediately toys followed this trend and nearly all new models have fenders which partly conceal wheels.

Electric lights also are coming to be essential on modern toys. While this equipment has been used for years on the more expensive variety of playthings such as electric trains, signals and the like, the application of lights to 25-cent toys represents a departure. Many of the new models of toy trucks and automobiles are equipped with two small flashlight bulbs mounted in the position of headlights. They are attached to a small dry cell which snaps into a bracket under the body. A switch is even provided for turning the lights on or off.

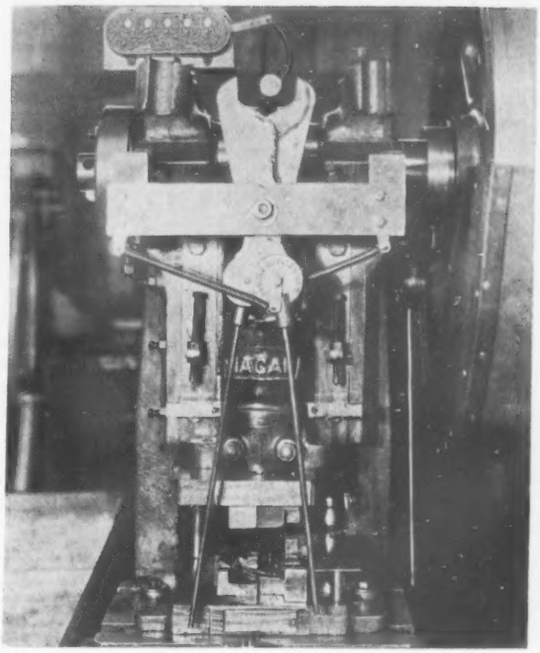
Here indeed is an interesting interruption of scrap flat-rolled material on its way back from the automobile plants to the open-hearth furnace, an interruption which brings many happy hours of play to the younger generation and which is the basis for a profitable industrial enterprise.

Government Publishes List Of Trade Associations

To fill a need which has been growing during the past year and a half, the bureau of foreign and domestic commerce, Washington, has published a list of "Selected Trade Associations of the United States" as of January, 1935. With the advent of the NRA and the encouragement which it gave to the trade association movement, the bureau has been besieged with requests for the revision of the trade association list previously issued.

The publication lists approximately 2500 trade associations, largely national and interstate. An introduction in the front of the booklet contains the following sections: Definition of trade association; number of selected trade associations; location of selected trade association; effect of the NRA upon trade association; principal activities; department of commerce; and other federal agencies.

Containing 74 pages of 8 x 10-inch size, the booklet was prepared under the general supervision of Wilford L. White, chief of the marketing research and service division, by C. Judkins, chief of the trade association section, with the assistance of L. Marceron and A. S. Grant. Copies of the list may be obtained for 10 cents.

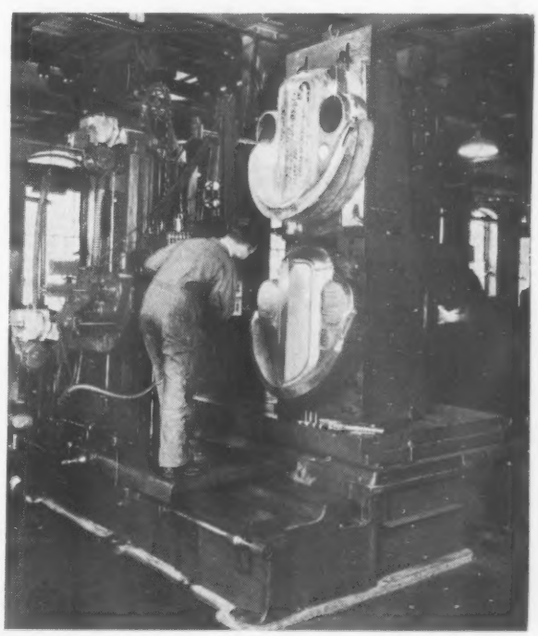


SPECIAL type of safety device used on all punch presses. As the ram of the press descends, the two vertical rods move outwardly, thrusting the operator's hands to one side and preventing injury. Use of this device cut accident insurance rates to one-third the old rates

Hard and Strong Electrodes

In certain cases where unusual hardness and strength are required, along with high conductivity, electrodes for use in resistance welding are being made of beryllium copper.

Semisteel for Radiator Shell Die



HARDNESS RANGING from 230 to 250 brinell coupled with ease in machinability are two physical characteristics obtained in this radiator-shell die. The die casting is being machined to simulate the lines of pattern held in position above the die. The dies were cast in the foundry of Schneider-Bowman Co., and the machining operations performed by the Atlantic Mfg. Co., both located in Philadelphia. The cupola mix contained Silvery Mayari, a high-silicon pig iron of natural occurring nickel-chromium content made by the Bethlehem Steel Co., Bethlehem, Pa.

MANUFACTURING IS SIMPLIFIED BY NEW DECIMAL SYSTEM OF MEASUREMENT

TWO years ago the Ford Motor Co., Detroit, adopted a decimal system of measurement intended to simplify design, tool making and manufacturing operations involved in the production of many parts for its cars and trucks. In the opinion of the company, it has proven so successful as to warrant complete disclosure of its details. The new system is employed in dimensioning of drawings and in the subsequent manufacturing operations and represents what the company believes to be the first departure from conventional dimensioning practice, at least in the automobile industry.

From time immemorial American manufacturers have clung to common fractions in measuring most dimensions. The "halves," "quarters," "eighths," "sixteenths," etc., up to "64ths" of an inch have been so firmly entrenched in the minds of engineers and production men as to warrant the belief that no improvement was possible which would retain the generally accepted English system of measurement.

Adoption of decimal fractions instead of common fractions for all subdivisions of the inch obtains one of the advantages claimed for the metric system of measurement without presenting the disadvantages which have been raised by American manufacturers against its more general use. To appreciate the value of the decimal system it is only necessary to note that when any of the common fractions in use today must be changed into decimals, and such changes are necessary thousands of times a day in any large manufacturing plant, the resulting decimal is of cumbersome length if expressed accurately.

Conversion Tables Unnecessary

For instance, 7/64ths of an inch, when converted to a decimal figure, becomes 0.109375-inch. The same is true, more or less, of all the remaining common fractions in the English system. When it becomes necessary to add long columns of common fractions, as must be done repeatedly both in making drawings and in manufacturing and checking the accuracy of parts made from them, the complication and chances for error are greatly multiplied. The conversion tables which every draftsman and machine shop man keeps close at hand are necessitated by the cumbersome nature of the conventional system.

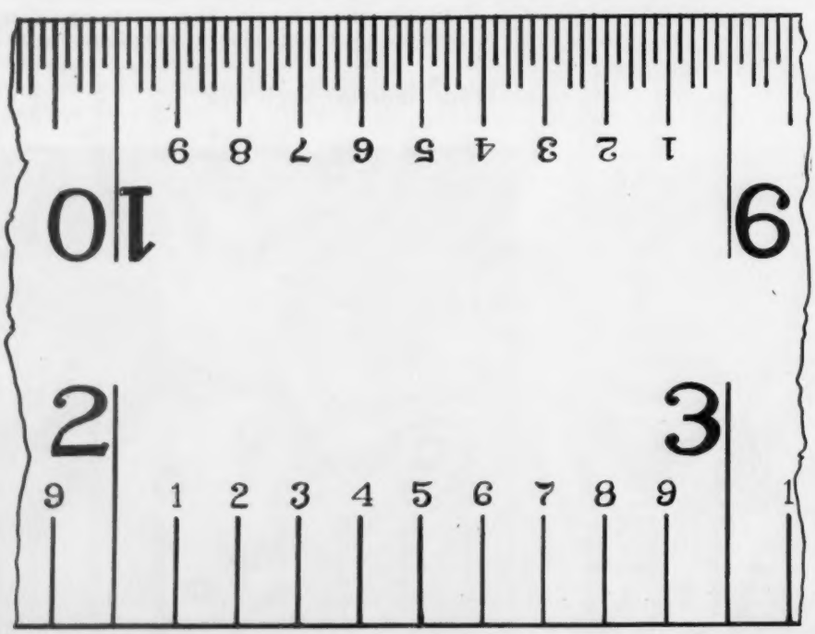
In the Ford system there are no such cumbersome dimensions. Nor are conversion tables necessary. Every measurement is simply expressed and easily read, and the chances for errors are practically eliminated. Only the simplest additions and subtractions need be used when dimensions are added or subtracted. What is perhaps more important, the new system works well along with the old, giving ample time for the "changeover," again overcoming one of the objections to the adoption of any completely different system. Where old parts must be made to match with new, or tools made according to the conventional system must be used, the simpler decimal system aids in reducing complications, even though it cannot be applied to its fullest advantage.

An important point in connection with the system is that when it becomes necessary to work to closer dimensions than are visible to the eye, as when micrometers are used to measure thousandths and ten-thousandths of an inch, or to set limits which the shop man must not exceed in making a part to accurate size, the figures represent merely the addition of two or three digits to an already existing decimal, rather than an incongruous converted common fraction to or from which the working limits have been added or subtracted.

Shows 1/50-Inch Divisions

The first step in actual use of the decimal system requires that everyone using it at once discard his customary way of thinking in terms of eighths, sixteenths, etc., and begin to think in terms of tenths. To make this as easy as possible, and to assure full understanding between the engineering department and various shops throughout the plant, all scales or measuring sticks marked off in common fractions were replaced by scales basically calibrated in tenths of an inch.

An interesting point is involved in this change. In the conventional system the smallest division which must be read by the naked eye is 1/64th-inch, and even this is difficult if repeated readings are necessary. Hence if 1/100ths were marked on the new scales, only those with exceptionally good eyesight and working in ample



In connection with the adoption of the decimal system by Ford, a new scale or measuring stick has been developed. As shown above, the finer divisions are fiftieths rather than hundredths and the marks for the second and third fifth are longer than for the first and fourth. Both of these features help to make a scale which is more easily read than a fractional scale broken down into 1/64-inch divisions

light could read the divisions. For this reason the scales are marked or divided in units of 2/100ths, or fiftieths, although all *figures* are expressed in "hundredths," such as 20, 40, 60, — 100.

Thus, while the dimensions are presented on all drawings in tenths and hundredths, it is only necessary to *read* subdivisions marked off in fiftieths, an easier division to see than the conventional 1/64-inch. In turn the use of fiftieths or multiples thereof compels every dimension requiring accuracy to such figures, to end in an even number. Thus the dimensions for diameters or for surfaces equispaced from centerlines are always divisible by two, and no splitting of common fractions is required, as may be the case when the conventional system is used.

Cleaner Drawings Possible

Another feature of simplicity is that all dimensions for which a tenth is sufficiently accurate require only one digit, as for instance, 0.7 or 0.9-inch. Where greater accuracy is required, the second or hundredths digit is added, but always in multiples of two, as previously noted, as for instance, 0.56 or 0.62-inch.

One beneficial result is that drawings using the decimal system are less congested with figures, cleaner and easier to read.

Where the former use of the conventional method of dimensioning still requires its continuance, and for the convenience of those who have not entirely become proficient in thinking in tenths, but only in such cases, it was decided to simplify the decimals resulting from converting the common fractions in the manner indicated as follows:

Decimal of existing common fraction	Common fraction	Ford decimal
0.015625	1/64	0.02
0.03125	1/32	0.05
0.046875	3/64	0.05
0.0625	1/16	0.06
0.078125	5/64	0.08
0.28125	7/32	0.3
0.46875	15/32	0.46

These figures are merely for convenience in translating the old into the new. They are *not* inherently a part of it. Such a question as "What do you use in the new system instead of 9/64ths?" is not involved. The old common fractions simply do not exist in the new, hence no conversion figures are necessary, except where the two systems must be used together for some reason.

The company finds the advantages from using the decimal system to be even more pronounced when determining dimensions through the use of trigonometrical functions, wherein the sines, cosines, tangents, etc., of angles must be multiplied or divided by the three to six-place decimal equivalents of common fractions to obtain the desired result. In the Ford system it is usual to have but one or two digits which must be multiplied by the trigonometrical function, thus materially reducing the time required and the chance for errors in a calculation of this type.

Gradual Transition

In the Ford plant today the old measurements are used only on parts which are made through the use of taps, dies, and similar tools which are available only in dimensions of the old system. New parts are made to the new system for every dimension where it can be used. Gradually the transition is taking place from the old to the new, without confusion and with complete knowledge of what is taking place. Eventually it is expected that every dimension of every part will conform to the new and simplified decimal system.

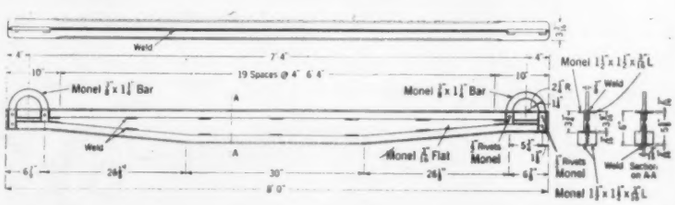
Shows Designs for Pickling Equipment

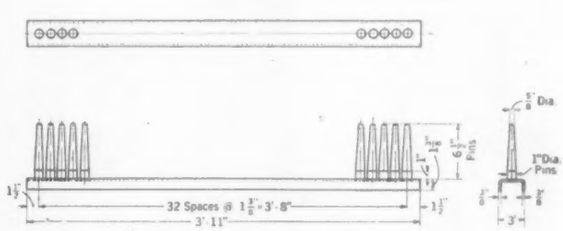
MUCH information of interest to the management of the pickling department is contained in a 26-page booklet entitled "Equipment Designs for the Pickle House," just issued by International Nickel Co., 67 Wall street, New York. It deals with all kinds of pickling operations, from heavy blooms and billets to nails and small forgings and castings.

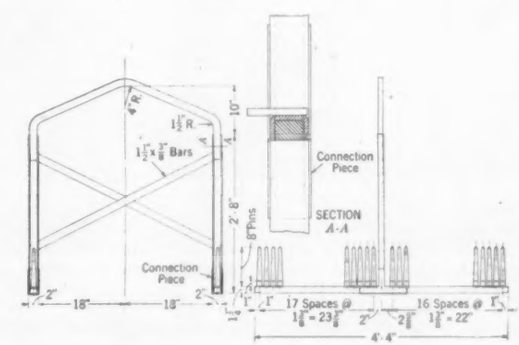
Welding Facilitates Designs

Illustrated liberally with both photographs and drawings, the booklet sets forth latest information on the design of pickling apparatus. Designs presented take into account the possibilities from the fact that Monel metal now can be welded so as to have strong, corrosion resisting joints. For instance, the booklet shows drawings of typical forged Monel metal hooks preferred by some wire producers and then shows a new beam, detailed in the accompanying illustration, for pickling wire in coil and whose construction is made possible by welding.

Several types of auxiliary combs for use in pickling strip in straight lengths, with comb and lifting device in one unit, are described and illustrated in drawings. An interesting crate used in pickling conduit pipe is shown. Numerous other features show tin plate crates, equipment for pickling hollow and bulky articles, sheets, coiled strip, heavy fabricated articles, rods, bars, pipe and tubing. The booklet also treats extensively of continuous pickling of parts, the construction of pickling tanks and of pickle house accessories.


Weld
Monel 1½ x 1½ x 5/16 L
Monel ⅝ x 1¼ Bar
19 Spaces @ 4" 6 4"
Monel ⅝ x 1¼ Bar
Monel ⅜ Flat
Rivets Monel
Section on AA
Monel 1½ x 1½ x 5/16 L





Welding makes practical the construction of the beam, shown above, for pickling wire in coil. At right is shown a welded comb rack and auxiliary comb, designed by Youngstown Welding & Engineering Co., Youngstown, O., for use in pickling strip steel in straight lengths. These drawings are reproduced from a new booklet by International Nickel Co., 67 Wall street, New York, devoted to design and construction of pickling equipment

METHODS AND MATERIALS

Sodium-Zinc Alloy Is Used For Deoxidizing Brasses

A sodium-zinc alloy, developed by the Grasselli Chemical Co., Cleveland, and the R & H Chemical division of E. I. Du Pont de Nemours & Co., Wilmington, Del., is recommended for use as a deoxidizer of brasses, and is said to be applicable to all nonferrous alloys where a content of 2 per cent or more of metallic zinc may be tolerated or is called for.

Constituents of the alloy are 98 per cent intermediate grade zinc and 2 per cent metallic sodium. It is cast in semicylindrical ingots provided with breaking notches for the sake of ready divisibility. The alloy is stable and may be stored.

After the brass batch is almost ready to pour, the requisite amount of sodium-zinc alloy is added in solid form. As the alloy breaks down, the sodium reduces any metallic oxides present in the bath. The resulting sodium oxide boils out of the bath vigorously. The original batch is made up with somewhat less zinc than the desired content, thus allowing for the addition derived from the sodium-zinc deoxidizer.

Extensive tests with this new deoxidizer have been conducted at various laboratories, notably that of the Scovill Mfg. Co., Waterbury, Conn. The new alloy is being marketed by the new products division, Grasselli Chemical Co., Cleveland.

$ $ $

"Methods and Materials" Is Title of Steel Handbook

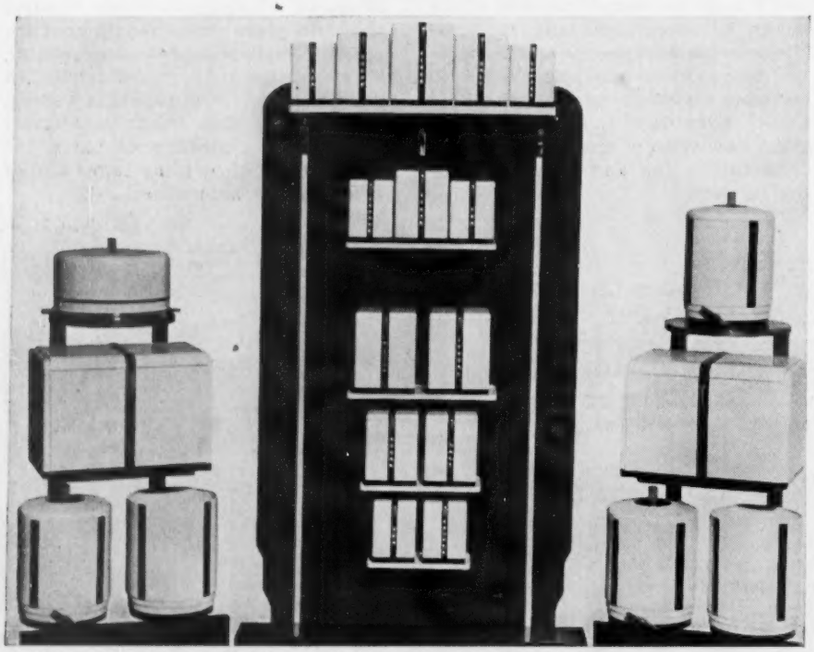
Edgar T. Ward's Sons Co., Pittsburgh, has prepared a convenient and attractive handbook, which, in addition to listing its steel warehouse services, presents complete specifications and information on its various products. Appropriately titled, "Steel —Methods and Materials," this book has separate thumb tab sections devoted to steel bars, tubing, strip and flat wire, steel sheets, tool steels, spring steels, spring wires, drill rods and aluminum. The new 1935 S.A.E. steel specifications are included in an extensive general information section. A detailed index concludes the book.

$ $ $

How Monel Metal Rivets Were Separated from Steel

Recently a lot of 1500 pounds of small monel metal rivets was returned to the manufacturer because a small number of steel rivets had gotten mixed into it. The large number of rivets involved made it impracticable to rust the steel rivets and pick them out by hand, a method often used with larger rivets. Ordinary magnetic separation was impossible because of the magnetic properties of monel metal. This metal, however, loses its magnetic properties at about 200 degrees Fahr., much lower than for steel. By

Ornate Steel Kitchen Accessories



COLD ROLLED STRIP STEEL IS MATERIAL PRINCIPALLY USED IN MAKING NEW LINE OF ORNATE KITCHEN ACCESSORIES, designed by George W. Walker, industrial stylist, Detroit, and manufactured by Watts-Morehouse Mfg. Corp., Jackson, Mich. Only exceptions are canisters, of tin plate, and cake cover, of spun aluminum. Brilliant, synthetic enamels, in six color combinations, are used for finishing, with bright red, molded plastic knobs as an added touch. This new line is being introduced through department stores from coast to coast

Increased Cutter Speed Means Increased Production–

SUNOCO HELPS YOU SECURE BOTH!

THE ability of a milling cutter to remove metal is heightened by increasing its speed, with the feed per minute remaining unchanged.

Cutter speeds are limited, however, by the heat generated by the removing of the metal. The higher the speed, the higher the temperature. Sometimes this heat becomes sufficient to draw the temper or burn the cutting edges of the milling tool.

High Temperature Problem Overcome by Sunoco

The problem then is to dissipate this heat and as a practical solution we suggest Sunoco Emulsifying Cutting Oil.

A copious flow of Sunoco over a milling cutter carries away generated heat. It also minimizes the amount of heat generated. It gives cutters longer life per grind; does away with frequent cutter changes.

Cutters Won't Burn; Chips Won't Seize

Use Sunoco and your cutters will not burn, chips will not seize. The cuts will be clean and even. Flood the work with Sunoco and prevent the grinding action of the chips on the finished surfaces.

Sunoco improves quality, increases output — a trial under your own operating conditions will convince you.

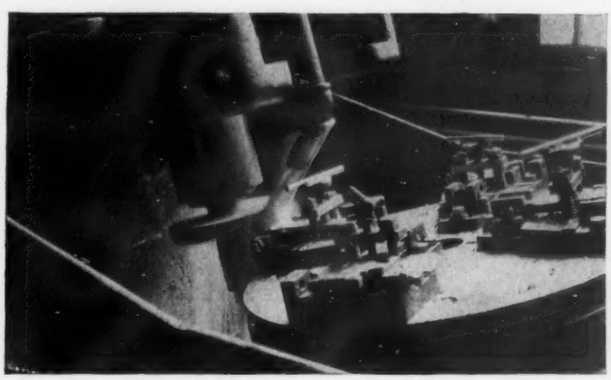
Operation: Milling bearing cap.
Machine: Oesterlein Heavy Duty Miller.
Material: Malleable iron.
Lubricant: 1 part Sunoco to 15 parts water.

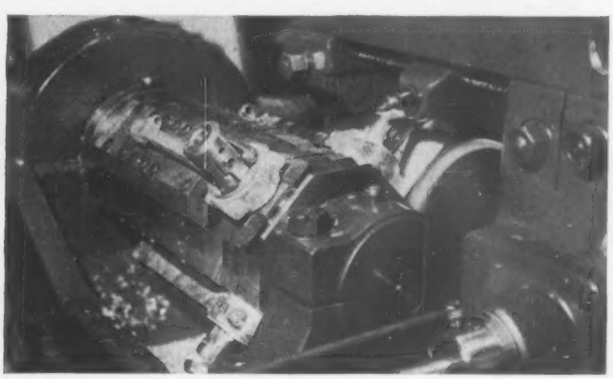
Courtesy of
Oesterlein Machine Co.
Cincinnati

SUNOCO
EMULSIFYING
CUTTING OIL

Operation: Milling bolt bosses and sawing off cap on connecting rod.
Machine: 3-24 Cincinnati Hydromatic.
Material: Steel forging.
Lubricant: 1 part Sunoco to 20 parts water.

Courtesy of
Cincinnati Milling Machine Co.
Cincinnati





SUN OIL COMPANY PHILADELPHIA, PA., U. S. A.
Offices and Warehouses in more than 100 Cities

Subsidiary Companies • Sun Oil Co., Ltd., Montreal, Toronto
• British Sun Oil Co., Ltd., London, England

heating the rivets to this temperature, the manufacturer was able to separate the rivets easily.

\$ \$ \$

Illuminated Gage Simplifies Inspection of Pistons

Inspection of pistons is accomplished with greater speed and accuracy in a large motor manufacturing plant by using a gage provided with four vertical rows of electric lamps, located to correspond with the various points on the pistons. The piston is placed on two steel runners and passed between gaging points. When the lamps in the inside rows are illuminated, the dimensions of the piston ring grooves are within tolerance. Inaccurate dimensions are indicated when one or more of the lamps in the outside rows light up.

\$ \$ \$

Producing Heat Resisting Castings by Special Method

A foundry producing heat resisting castings subjected to intermittent temperatures ranging up to 1800 degrees Fahr. uses a mixture of 50 per cent straight bessemer pig iron, 30 per cent steel rails and 20 per cent silvery mayari pig iron of from 10.40 to 10.50 per cent silicon. Ferrochrome carrying 70 per cent chromium is added at the spout in the amount of 14 ounces per 100 pounds of metal. The resulting analysis is as follows: Silicon, 2.2 per cent; manganese, 0.8 per cent; phosphorus, 0.08 per cent; sulphur, 0.06 per cent; chromium, 1.00 per cent; and nickel, 0.02 per cent. The castings are normalized at 1000 degrees Fahr. and are said to give better than 800 hours continuous service.

Wanted—Information on Metal Known as Magnalite

"We are interested in locating a metal or alloy selling under the name Magnalite," writes a reader of STEEL. "If you can furnish the name of the producer it would be appreciated. In addition we would like to know just what this metal or alloy is, its weight per cubic foot, whether or not it can be worked, its reaction to heat and cold and, in fact, all available information."

Arc Welding Electrode Suitable for Making and Salvaging Cutting Tools

LATHE tools, bits, reamers, milling cutters, drills, cutting and forming dies and other tools, which have become worn in service, now can be given a new and hard cutting edge through use of a new arc welding electrode placed on the market by the Lincoln Electric Co., Cleveland. The electrode also can be used for manufacturing tools from ordinary steel. Known as Toolweld, this new electrode is the product of research over several years.

Savings to be made through use of the electrode in tool salvaging are estimated by the company as 15 per cent of original tool cost. Savings also are to be made by using less expensive steels for tool fabrication. For example, the company states that by using low alloy steel in place of tool steel, a tool can be made with the electrode at a saving of 35 per cent on material cost alone; even greater savings are effected when low alloy steel is used in place of special high priced materials.

Salvaging tools with the new hardfacing electrode requires an arc welding machine of proper capacity, a supply of electrode, an experienced arc welding operator and miscellaneous welding accessories. The method of application is no different from ordinary welding in mild steel.

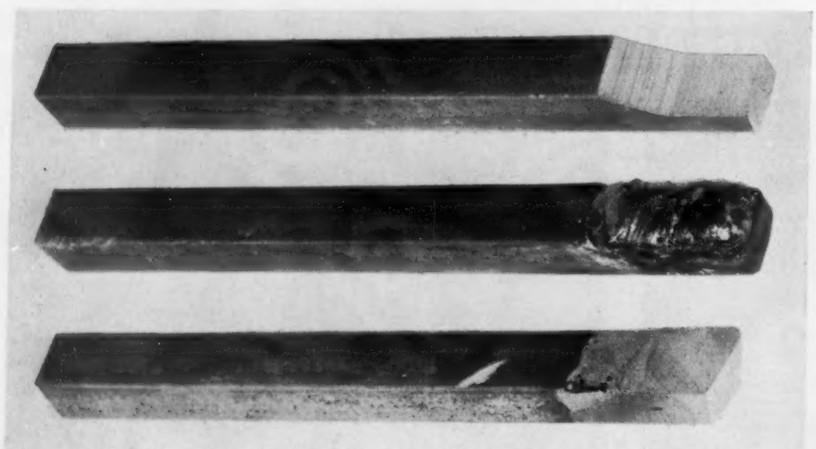


Fig. 1—Lathe tool made from cold rolled steel. (Top)—The piece prepared for application of tool steel electrode. (Center)—The deposit applied. (Bottom)—Deposit ground down to proper shape

Technique of Tool Making

In making tools from alloy steel, a piece of steel is cut to proper thickness and length for the particular tool. The face and one edge of this piece of steel is then ground down to a depth of approximately ¼-inch for a distance of about 1 inch from what is to be its cutting edge. The piece of steel is then placed in a simple fixture and the deposit of electrode metal made on the face and edge which has been ground.

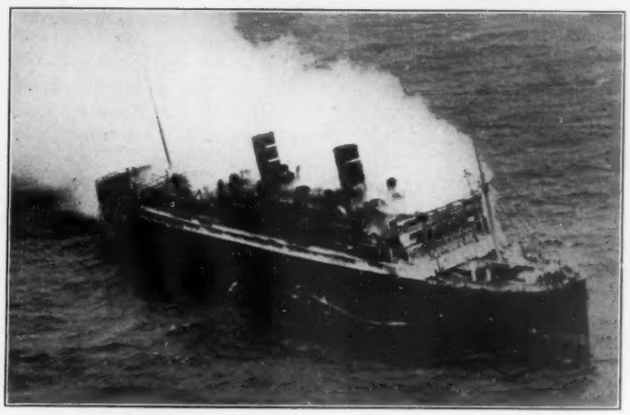
In applying the electrode, a welding current of reversed polarity (electrode positive, work negative) is used. Current is determined by the size of the electrode employed. The following table indicates proper current settings for the four sizes in which the electrode is made; this table, however, is to be used as a guide only, the exact values being determined by the mass of the parts being surfaced, thickness and hardness of bead desired, etc.:

Electrode size, inch	Current range, amperes	Arc voltage
3/32	30-65	21-25
1/8	65-100	22-26
5/32	90-160	23-27
3/16	125-200	25-29

Having determined the proper current, the welding operator applies the deposit with a weaving motion of the electrode to eliminate porosity. The hardness of the deposit will vary somewhat, depending upon the admixture of base metal with the deposit. Hardness is increased by deposit of additional beads and by permitting each bead to cool slowly. Hardness, depending upon the number of beads and rate of cooling, will vary between 55 and 65 Rockwell C. Where only one bead is deposited, low current should be used to keep down the admixture of base metal with the deposit.

After the cutting edge has been built up, care being taken to clean each bead thoroughly before the next is deposited, the deposit is

HARRIS "CITY GAS" TORCHES TO CUT UP ABANDONED "MORRO CASTLE"



The $5,000,000 Morro Castle has been abandoned by her owners and underwriters, being condemned by the Navy as unfit for use. The Ward liner was taken by the Army as a menace to navigation and sold to Union Shipbuilding Company of Baltimore, the highest bidder.

The above fact was published in the April 8th issue of "Time" magazine.

FLASH

To users of Cutting Torches—the Union Shipbuilding Company, one of the largest scrapping institutions in the world; manufacture their own oxygen and can scrap an 8000 ton ship complete in "Five Days".

USE OF "CITY GAS" AND "HARRIS TORCHES" MAKES POSSIBLE AN

88% FUEL SAVING
12% OXYGEN SAVING
5% INCREASED SPEED

Union Shipbuilding Company will realize the above savings because of their standardization on "Harris" City Gas Cutting Torches exclusively. The above selection and standardization followed SIX MONTHS of unbiased, intensive test and investigation made by "Independent Engineers" employed for the purpose. Harris was selected from 6 standard makes as the only City Gas Torch superior to acetylene.

According to the Record (see "Gas Age Record," June 13, 1931) or ("Industrial Gases", August 1931) they will reduce this great ship to scrap in terms of 100 sq. inches of metal displaced with the following Gas consumption.

COMPARISON CHART

Harris No. 75 Torch . . . 43.7 cu. ft. oxygen—14.39 cu. ft. City Gas at an average speed of 402 inches per hour.
Acetylene Torches previously used . . . 49.7 cu. ft. oxygen—8.4 cu. ft. acetylene at an average speed of 380 inches per hour.
Saving . . . 12% oxygen—88% Fuel Gas—Speed increase 5%

WHICH MEANS—*They have ABANDONED the use of ACETYLENE for cutting in this case*

Many steel mills, shipyards, etc., as well as "one torch shops" are SAVING MONEY and DOING A BETTER JOB with "Harris" City Gas Torches. There are thousands of members in the "Harris Family".

DISTRIBUTORS IN ALL PRINCIPAL INDUSTRIAL CENTERS CAN FURNISH FURTHER DETAILS

THE HARRIS CALORIFIC CO.

CLEVELAND, OHIO

Oldest Gas Welding and Cutting Apparatus Company in U. S. A.

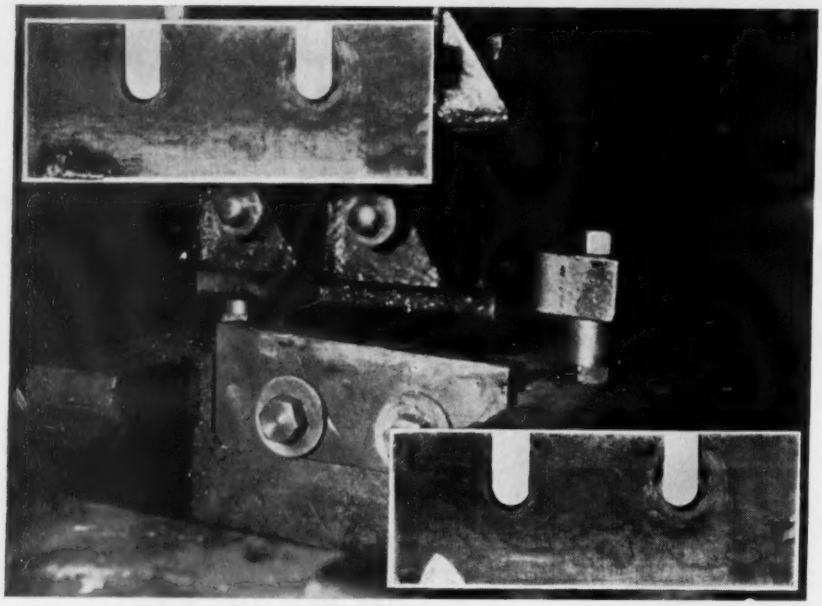


Fig. 2—A shear in which the cutting edge of the coping die was nicked in service to a depth of ⅛-inch was repaired with tool steel electrode. Inset (upper left) shows the nick welded up; inset (lower right) shows the deposit ground down. This repair was effected in 30 minutes and the die successfully withstood a rigid service test

ground to suit the particular requirements of the tool. This same procedure is followed in refacing old tools and can be used any number of times.

The electrode provides a deposit which is claimed to be equivalent to high speed tool steel. This deposit can be heat treated in the same manner as high speed steel and will retain its hardness under relatively high temperatures, up to approximately 1000 degrees Fahr. If properly handled, the electrode will produce a very dense deposit with practically no porosity.

Examples of Application

Fig. 1 shows a lathe tool made from rolled steel. At the top, the piece of steel is prepared for application of the tool steel electrode; in the center, the deposit is applied; and at the bottom, the electrode deposit is ground down to proper shape. In service alongside a regular tool, this built-up tool stood up well.

Fig. 2 shows a coping die on a shear which had a nick ⅛-inch deep and 1 inch long on the cutting edge. This die was welded up as shown in the inset (upper left), ground down as shown in the inset (lower right) and put back in the shear. It was then used to shear all types of material and finally ⅜-inch by 2-inch flat band steel stock. At the end of the test, no signs of wear were evident on the resurfaced edge. This tool was repaired and reinstalled in the shear all within 30 minutes.

Detailed instructions on the use of the new electrode are presented in electrode procedure bulletin No. 0-13 obtainable from the Lincoln Electric Co., 12818 Coit road, Cleveland.

Miniature Bench Depicts Cold Drawing of Tubing

A miniature draw bench was used by J. P. Dods, manager of sales, Summerill Tubing Co., Bridgeport, Pa., in demonstrating, before the engineering students of Cornell university, Ithaca, N. Y., and also before a joint meeting of the Rochester, Syracuse and Southern Tier chapters of the American Society for Metals at Ithaca, April 15, the processes used in the finishing of seamless tubing. He outlined the first piercing operation, showing split billets stopped in process, and then described the cold drawing processes, exhibiting split tubes, including the mandrel and die.

Thereafter followed a discussion of the manufacture of various seamless tube products, such as aircraft tubing, diesel engine injector tubing, golf clubs, fishing rods, capillary tubes, bourdon and spring tubes, telescope tubes, flexible metal hose, cathode sleeves, precision pump tubes, shotgun magazine tubes, composite tubes of copper or nickel in combination with steel and a variety of tubular shapes such as streamline, oval, squares and others.

Turntable Service Stations in New York Of Modern, Steelized Design

PORCELAIN enameled steel sheets with stainless steel trim enhance the decorative features of new rotary service stations of the Colonial Beacon Oil Co., two having been completed in New York. Known as the servicenter, the central feature is a turntable which revolves at slow speed around the station pumps, expediting service to

Steel is used extensively in this merry-go-round automobile service station, both as a decorative material to meet the modernistic design and in the mechanical operation of the turntable, from which three cars can be fully serviced simultaneously at the rate of 100 per hour

the motorist whose car may be filled with gasoline, oil, water and air in less than two minutes. Three cars may be serviced simultaneously, the motorist driving directly onto the turntable and making the circuit in successive third turns of the electrically operated servicing platform.

An unusually heavy structural steel riveted frame, strongly reinforced with struts, carries the circular platform of 3-inch wood planks, the turntable revolving on two sets of cast iron rollers on steel tracks, one carrying the outside circumference of the platform and the second the inside. The structure will support a 12,000-pound load at any point.

Center Space Stationary

The turntable revolves around a stationary island in the center of which is located the office, display room and pump units. Movements of the turntable are controlled from the island-office, which is largely of glass in stainless steel frames, including windows and doors. At the base, the office is enclosed with red porcelain enameled steel. From the island to the outside periphery of the turntable the moving platform is 12 feet 2 inches.

To meet the modernistic design, porcelain enameled steel in contrasting colors is also used extensively as background for the large signs, including a tower, framework of the latter being of structural steel. Raised wood letters are attached to the metal with standard brass clips and screws. Small display rooms at each side of the entrance are also of porcelain enameled and stainless steel.

Meets City Requirements

Six 550-gallon tanks are located in the basement, also all piping which is of galvanized and wrought iron, screw jointed. Pump and tank equipment is of extra heavy materials to meet city requirements for congested areas.

The servicenter is especially adapted for location between blocks in congested districts, requiring a small site, and allowing a maximum of quick service. Backing and maneuvering of the automobile to reach the pumps is eliminated. When a more elaborate service is required, change of oil or greasing, the automobile is moved to a half-position on the turntable in place to drive to the rear where these jobs may be done. The New York stations are the first in an experiment which will be followed by additional units in other large cities if as successful as their designers expect. The servicenters are located at 93 Lafayette street and at Sixth avenue, near Sullivan street.

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

Consequences

PROTECTING man from the consequences of his own folly is dear to the heart of all brain trusters. The mere fact that no one ever had much luck at it is no discouragement to them. Yet in manufacturing industry the "human element," which represents the capacity to err, is eliminated successfully in many cases. In automobiles and aircraft, millions of welds have shown a normal service life with no failures. The point of difference is that although imperfect welds may be made, inspection prevents the imperfect ones from going into service. A weld has no constitutional rights or personal preferences. If the weld is defective we can detect it and throw it out.

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

In the field of economics it is a large order to detect defective judgment until the acts themselves are completed. Any contemporary board of review would have ruled Henry Ford and his early Model T cars were both defective. The only competent board which could have been assembled would have been made up of automobile manufacturers and they would have been unanimous in believing Henry was crazy. It probably never occurred to contemporary competitors to ask some government bureau to put Ford out of business. To have done this would have involved the possibility of having the same bureau put some of the plaintiffs out of business.

Competition exacts a penalty for folly. The manufacturer with high costs loses his business to a competitor who is more efficient. The preacher of shabby morals loses his pulpit to a better man. The young man with halitosis loses his girl to a fellow who uses mouthwash, if not his brains.

If the brain trusters succeed, it seems to us they will have removed the only yardstick by which we can determine the difference between folly and good judgment—consequences.

From the Ground Up

Every conspicuous success in the application of welded construction has been the result of beginning at the beginning of the design problem. Thus, a General Electric domestic heating furnace was made of welded construction merely incidental to bringing out a high grade type of apparatus. It is always easier to make profitable use of welding on a new product which is designed from the ground up. Applying a little welding to a number of products which were designed for other methods of construction usually leads to the conclusion that it will pay to scrap the old designs and start at the beginning.

The present necessity in manufacturing industry of reducing costs at a speed never before accomplished is a compelling factor in re-design projects.

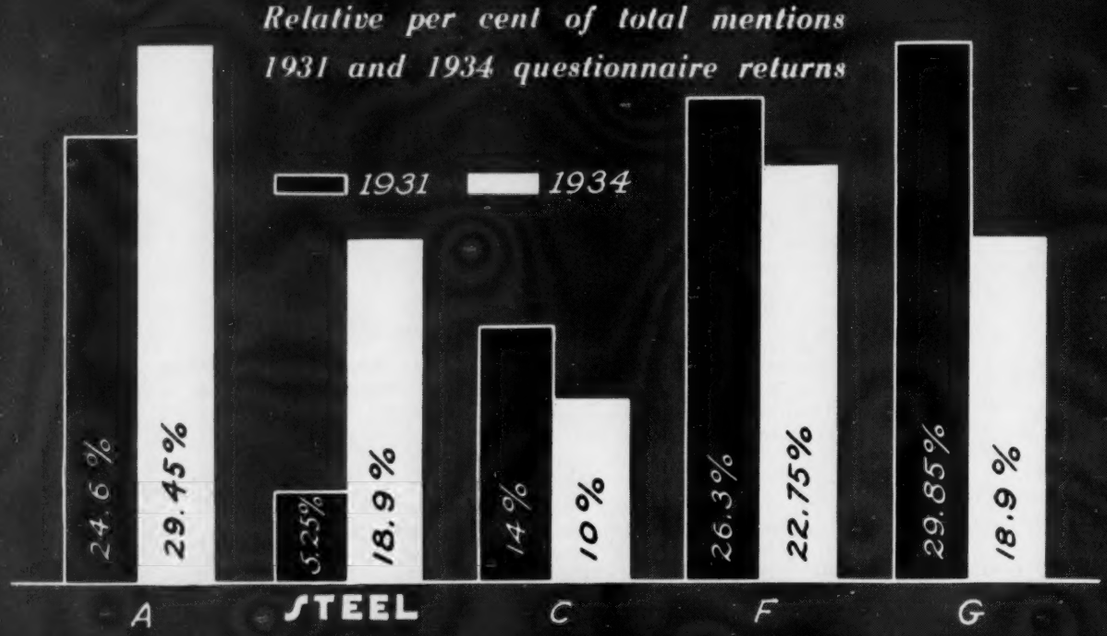
Short Shorts

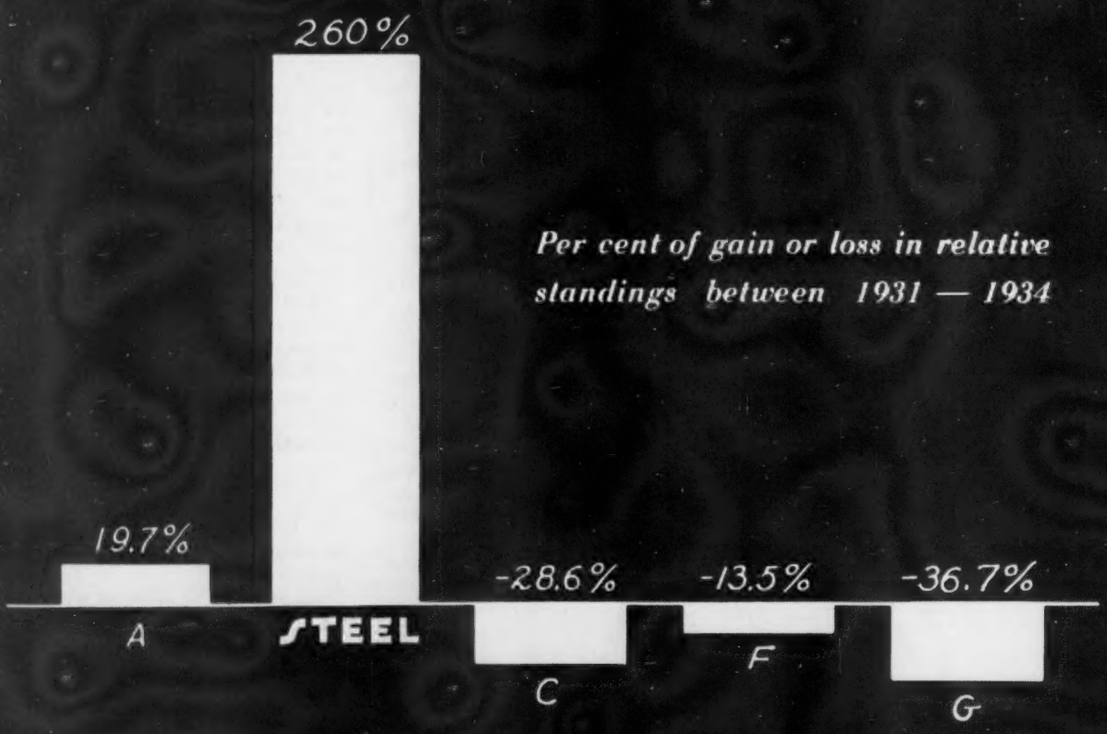
The president of a company manufacturing tank cars said to a welding man that he would be damned if he could see where welding would change his business to any extent. That year, 9000 miles of welded pipeline was layed to transport oil and gasoline. Not so many tank cars are needed. The president was right; he was damned by his own ignorance.

A weld timer is a device for controlling duration of application of electric heat in a welding operation. Scientific method begins with measuring a variable; ends by completely controlling it.

Comparative results of two

*reader surveys of publications made by a power transmission equipment manufacturer**





*Explanation on request

N. B.—Publications charted are first five on 1934 list.

Just another proof that **STEEL** *is the* ***fastest growing Industrial Publication***

—Courtesy Chain Products Co., Cleveland

TRACTOR chains are provided with heavy lugs of molybdenum alloy steel, in place of the usual cross members. The chain shown here weighs about 200 pounds

LARGE USES OF STEEL IN SMALL WAYS

285th Article ◆ Tractor Chains

INCREASING use of pneumatic rubber tires on heavy tractors and trucks has resulted in widespread increase in the use of tractor chains to provide increased traction when operating on muddy ground or under severe conditions. In many cases tractor chains are of the same design as those used on ordinary automobile tires, excepting that they are of steel wire of heavier gage. Specially designed chains, however, now are being marketed for heavy-duty use.

Forged Steel Lugs

One of these special types is shown in the accompanying illustration. It has the usual side or rim chains, but the tread portions of the cross chains are replaced by heavy steel lugs. These are hot formed in a forging press from ¼-inch molybdenum alloy steel plate. The lugs weigh on an average of 10 pounds each, depending on their size, and the number used in a chain, depending on the diameter of the tire, ranges from 7 to 12. The rim chains and the cross chains which hold the lugs are formed out of ⅜-inch diameter, molybdenum alloy steel wire. Chains and lugs, after forming, are case-hardened by carburizing in a rotary gas furnace, after which they are tumbled to remove scale. Weight of the tractor chains shown averages 200 pounds of steel each.

Chain used generally is of the straight-link coil type, formed in automatic chain machines. The links are closed by automatic resistance welding.

Tractor chains must be put on and off with facility, since they are used only where the going is rough and are removed when the vehicle is to be hauled at speed over paved highways. The end fasteners, stamped out of heavy steel plate, must be designed to lock and unlock without difficulty. In addition, they frequently are plated with brass to prevent the formation of rust which has a tendency toward making it harder to manipulate these fasteners.

Objects to Seal of Quality Methods

D. T. HADDOCK, American Sheet & Tin Plate Co., Pittsburgh, declared at the American Zinc institute's annual convention in St. Louis, April 23, that galvanized sheet producers object to the way the American Zinc institute is promoting its "Seal of Quality" program.

He said that his company was one of the first to subscribe to the institute's program but that the sales pressure on sheets carrying two ounces or more of zinc was driving farmers to the use of composition roofing.

Mr. Haddock declared that the institute should first emphasize sheet metal roofs and zinc coatings secondly. He answered earlier charges by declaring that producers are not "gyppers" but have been giving customers what they want. Generally speaking, he said, the industry is producing galvanized sheets of good quality but some seconds are being offered on the market by unscrupulous dealers.

He also pointed out that the weight of the coatings depends on the locality where the sheets are to go into service. He cited as example the fact that a sheet in service in Pittsburgh probably might last only a few years but in Canada might endure 25 or 30.

Sheet Quality Far Advanced

Galvanized sheets produced today cannot be compared to those of 50 to 70 years ago, he said. Sheets of that day were soft and porous and absorbed a heavy coating of metal. Sheets produced today by the cold-rolling process have a smooth surface and could not possibly take more than one-half ounce per square foot unless properly prepared.

Mr. Haddock declared that it is up to the Zinc institute to promote the use of "Seal of Quality" sheets. "Good salesmanship can make an outstanding case for metal roofing, particularly in two important fields —industrial, where the advantages of metal are unquestioned, and rural, a field representing possibly the greatest number of roofs."

W. D. James, president, James Mfg. Co., Fort Atkinson, Wis., chided the zinc industry on the small amount of money it spends to promote the use of its product. He derided the sellers of light coated sheets who scatter their product broadside. These tactics, he said, build up resistance for his business of making galvanized steel farm buildings.

Mr. James declared that annual terrific fire losses could be reduced greatly by adoption of metal buildings. His company has developed a building similar to a silo for the storing of hay which eliminates spontaneous combustion.

Approximately 85 per cent of galvanized sheets produced in this country, it was stated, now are made under license from the American Zinc institute.

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FEW users of F-M motors ever have occasion to come in contact with the men who actually design the product. But your problems of starting current, speed, slip, torque, operating conditions and a dozen other factors, are constantly reported to F-M design headquarters by our widely-flung field forces. This broad experience, based on specific facts in a hundred fields of industry, and with the thousands of F-M motors in industrial service, is responsible for the mechanical excellence of F-M motors.

From the early days of the electric motor, this policy of working closely with users to keep design always ahead of the times has been an "extra dividend" to every purchaser of an F-M motor. It is his assurance of correct design and long life for the motor he buys.

F-M type QC fan-cooled, totally enclosed motors have been especially designed for service in metal-working and in those plants where metal dust, steam, moisture and corrosive fumes are likely to shorten motor life. Because this special line of motors is completely enclosed and fan-cooled, with its windings protected, cooling air cannot carry metallic dusts to cause short circuits. Corrosion and moisture cannot cause mechanical failures.

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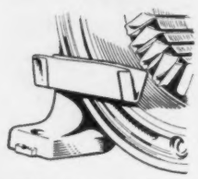
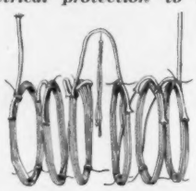
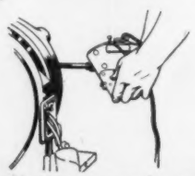


Special self-locking cuff insulation in stator core slots gives permanent protection from slippage and added mechanical and electrical protection to windings.



Group wound coils from a single piece of wire eliminate many stub connections which are a source of mechanical failure. Lead connections are WELDED for permanency.



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MOTORS

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Develops New Low-Alloy, High-Stength Steel for Transportation Field

BY HOWARD L. MILLER, Metallurgist
Republic Steel Corp., Youngstown, O.

PRESENT condition of our railroads with their pressing demands for decreased operating costs is more critical now than it has ever been before in the history of transportation.

Two of the most important factors in the high cost of transportation are the tremendous weight of equipment as compared to paying load, and the rapid deterioration of equipment due to continual exposure to the elements, with resultant rusting and corrosion.

Every railroad man is vitally interested in the question of increased pay load and decreased maintenance which will come with the use of stronger materials which are at the same time more resistant to attack by the elements. Decreased weight means increased pay load and higher speeds. Increased resistance to weathering and corrosion means decreased maintenance and much longer life. Higher speed is the railroads' answer to the public demand for quicker delivery, faster schedules, etc., and the decrease in carrier weight will go far toward improving the performance of motive power in delivering goods.

The experiments which have been made recently in using steels of special analysis, aluminum alloys, etc., in the construction of freight cars, indicate that railroad men are actively seeking some way to improve the position of the railroads by decreasing weight as well as by increasing performance.

The contribution of Republic Steel Corp. to this vital and pressing need has been the development of a copper-nickel-molybdenum steel which offers a combination of high strength, ductility and resistance to atmospheric corrosion. This steel, known as Republic Double Strength, is a result of several years of special research based on many more years of experience in the production of copper-bearing steel and copper-molybdenum alloy iron.

Proved in Service

Effectiveness of this combination in increasing corrosion resistance has been thoroughly demonstrated both in service and in officially conducted tests. Double strength steel shows similar characteristics, since it is of the same type. It is significant that this steel shows an exceedingly tight oxide skin under exposure to the most severe industrial atmosphere, and for this reason is particularly advantageous in railroad and automotive truck equipment used in carrying coal and other corrosion-promoting products.

Double strength steel is the first analysis showing as high a copper content, to be placed on a commercial basis in rolled products. It will be watched with considerable interest by the metallurgical world in general. The physical properties of the two grades as shown below can be increased 15,000 to 20,000 pounds per square inch by tempering sheets at 900 to 1000 degrees Fahr. for about one hour of temperature. The commercial value of these higher properties is somewhat problematical at present, but the fact that these higher physicals easily can be obtained may cause the engineering profession to develop useful applications for them.

This steel is made in two grades, the chemical and physical specifications of which are shown in the following summary:

Chemical Composition

	Grade 1	Grade 1-A
	——Per cent——	
Carbon	0.12 max.	0.30 max.
Manganese	0.50-1.00	0.50-1.00
Copper	0.50-1.50	0.50-1.50
Nickel	0.40-0.80	0.40-0.80
Molybdenum	0.20 max.	0.20 max.

Physical Properties of Normalized Sheet, Strip and Plates

GRADE 1	
Yield point, lbs./sq. in.	60,000 min.
Tensile strength, lbs./sq. in.	75,000 min.
Elongation in 2 in., per cent	25 min.
GRADE 1-A	
Yield point, lbs./sq. in.	70,000 min.
Tensile strength, lbs./sq. in.	90,000 min.
Elongation in 2 in., per cent	18 min.

It is interesting to note that even with its unusual combination of high strength, corrosion resistance and ductility this material can be fabricated without difficulty. It lends itself readily to any of the operations required in the construction of railroad equipment.

Shows Little Air Hardening

In order to fabricate satisfactorily such large sections which cannot be annealed or heat treated after welding, it is necessary to have a high strength material which does not air-harden. Republic double strength has little tendency to air-harden; hence it is very adaptable to welding by the arc method. It can also be satisfactorily spot resistance-welded.

With the proper welding wire and procedure, tough, strong welds are readily produced. Material under No. 16-gage should be spot welded, as it is too light to weld satisfactorily by other means. Arc welding can be accomplished satisfactorily on material as light as No. 16-gage. No difficulty is encountered in welding the heavier gages.

The metallurgist has a wide choice of alloying elements from which to make selection for raising the physical properties of the present structural steel. These alloys fall into two groups or classifications, with regard to the nature of the strengthening effect they have upon the original analysis. The first of these groups is called the carbide formers or pearlitic group of alloys. The second group shows the alloys that affect the strength of the ferrite. They might be called the ferritic alloys.

The carbide group includes carbon, manganese, chromium and tungsten.

The ferritic group includes copper, nickel and molybdenum.

Silicon and phosphorus are not strictly in either class, as phosphorus

does not combine with carbon but forms an analogous compound, iron phosphide (Fe_3P), which increases strength at the expense of ductility. Silicon in excess of 0.25 has a strengthening effect but lessens ductility.

Carbide Increases Strength

The carbide group of alloys when added to the regular steel increases the strength by increasing the percentage of iron carbide (Fe_3C). This constituent is governed in the intensity of its effect by the rate of cooling of the metal through the critical range in the last process of fabrication. These alloys produce what is called the air-hardening effect. This air-hardening effect is to be avoided in sheet and strip products as well as in welded plates, for the reason that different gages of sheet and plate, rolled from the same heat, when cooling from the normalizing heat will show considerable difference in physical properties. This condition, when carried out to produce steels strong enough to carry 50 to 100 per cent more stress than the present analysis will require considerable difference in the amounts of alloys required to produce the same range of properties in gages from No. 20 gage sheet to ¼-inch plate. On this account, this type of alloy steel carries in its analysis a world of grief for the steel producer as well as for the fabricator, as has already been proved.

The ferrite alloys dissolve in the iron matrix and strengthen the basic part of the metal itself. Of these alloys, copper, when above 1.0 per cent, has a remarkable effect in raising the yield point of the steel without as much effect on the ultimate strength, and very little reduction in elongation. Tests made on regular production sheets of the copper-nickel-molybdenum steels, show an average yield point of 80 to 90 per cent of tensile strength and 30 to 35 per cent elongation in 2 inches. The addition of 1.40 per cent copper, 0.75 per cent nickel, and 0.107 per cent molybdenum to a steel with 0.08 carbon and 0.70 manganese has produced in normalized sheets, No. 14 gage, a yield point of 70,000 pounds per square inch, an ultimate strength of 80,000 pounds, and elongation of 30 per cent in 2 inches. This same sheet after tempering at 950 degrees Fahr. for one hour showed 95,000 pounds yield point, 100,000 pounds tensile and 25 per cent elongation in 2 inches.

From the same heat, a ½-inch plate, after normalizing, showed 65,000 pounds yield point, 74,000 pounds tensile and 50 per cent elongation in 2 inches on the 1½ x 2-inch gage length test. Elongation in 8 inches was 31.0 per cent. The Izod value was 76 foot-pounds. The longitudinal physical properties of the ½-inch plate after tempering at 950 degrees Fahr. were 89,000 pounds yield point, 99,000 pounds tensile, and 35 per cent elongation in 2 inches, 26 per cent elongation in 8 inches, and 85 foot-pounds Izod.

This is an exceptionally tough condition if we consider the yield point and tensile strength of the steel. Without the copper, nickel and molybdenum addition, this carbon and manganese would not show much over 32,000 pounds yield point and 52,000 pounds tensile in the ½-inch plate, and 38,000 pounds yield point and 56,000 pounds tensile in the normalized No. 14 gage sheets.

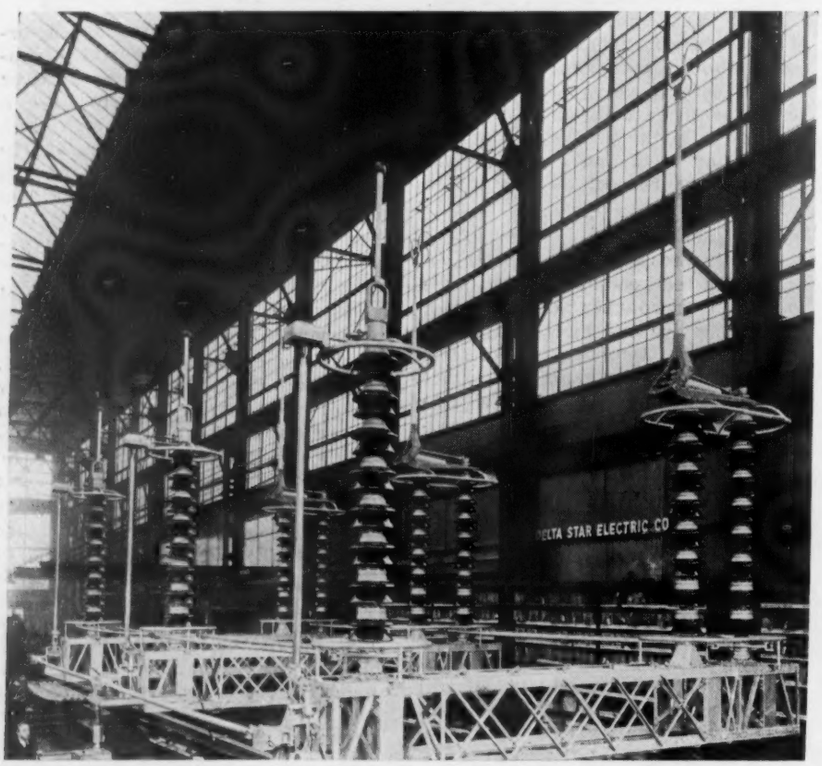
The copper is added for increasing yield point and improving rust resistance. The nickel combines in the iron with the copper and has a great toughening effect, increasing the Izod or shock resistance of the steel. The molybdenum has the effect of holding both the copper and nickel in solution in the iron. Reheating in fabrication has very little effect on microstructure or physical properties.

Permits Reduction in Thickness

Common practice is to design to a unit stress of 16,000 pounds and to use 32,000 pounds as the yield point for structural grades of steel. This is a relationship of two to one, as yield point equals twice the calculated stress. With increased speeds the kinetic energy increases in the order of the square of the velocity in feet per second and it is recommended that for safety's sake the factor should be increased to at least 2½ to 1, such as 40,000 pounds yield point for a 16,000-pound stress. On this basis, a structure reduced one-third in thickness would develop around 24,000 pounds unit stress and a 60,000-pound minimum yield point should be required.

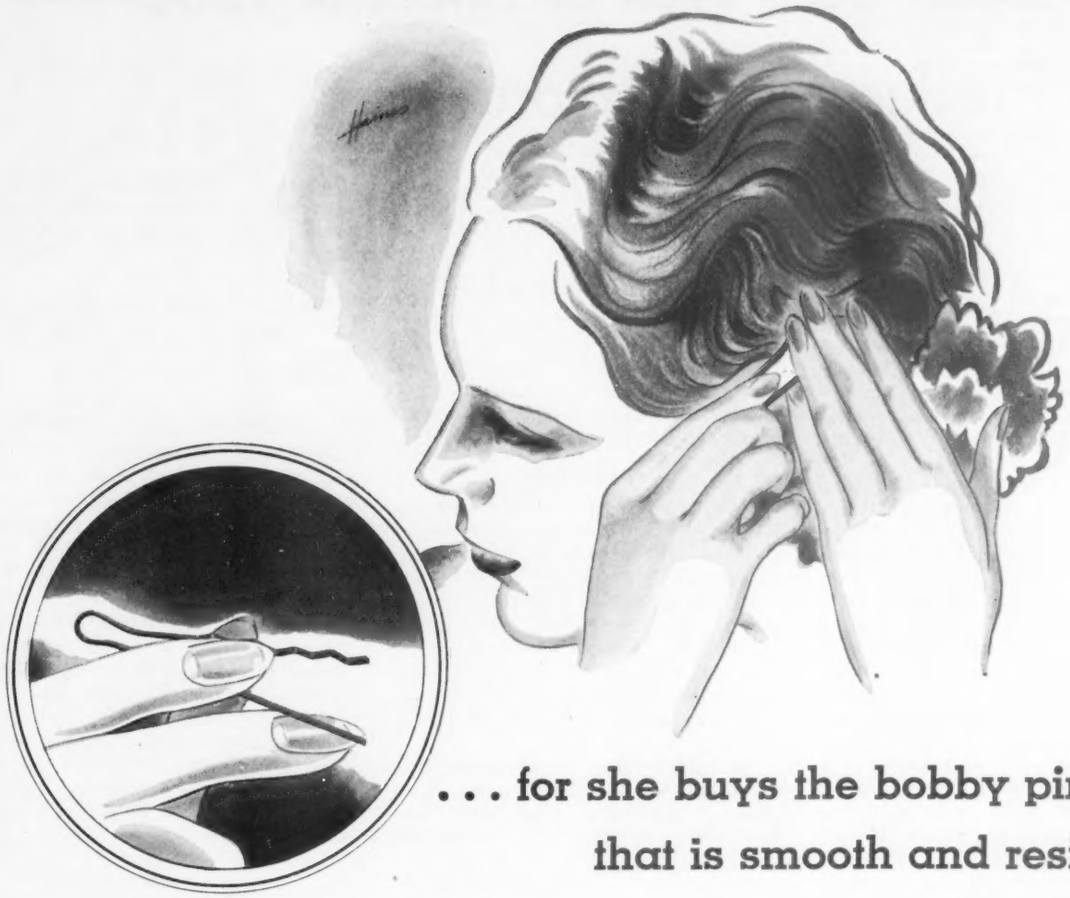
A 40 per cent reduction in gage would develop 26,600-pound stress and require 66,600-pound yield point, and a 50 per cent reduction develops a 32,000-pound stress and should have a minimum 80,000-pound yield point steel. These yield points and several even higher are being commercially produced in Republic double strength steel, and are being applied in various forms of transportation equipment. Some of these units have already been in drastic service for more than a year without a failure to date.

Huge Switches Consume Much Steel



THREE-POLE, MOTOR-OPERATED, 287,000-VOLT SWITCH WEIGHS 15 TONS, OF WHICH 6 TONS TAKE THE FORM OF STEEL SHAPES IN THE BASE: One of 16 gigantic switches for the 240,000-kilowatt transmission line from Boulder Dam to Los Angeles. Steel also is used in interconnecting pipes and operating mechanisms and in sheet steel enclosures for the motor operating mechanisms; levers, clevises and other parts are steel castings, while the porcelain insulators have malleable iron caps and pins. Steel ball bearings are used in all rotating elements. The nonferrous elements at the top are of bronze and the tubular blades of copper. These switches were manufactured by the Delta-Star Electric Co., 2400 Fulton street, Chicago

SHE DICTATES WIRE SPECIFICATIONS



. . . for she buys the bobby pin that is smooth and resilient

True round blunt points, perfectly smooth edges, attractive and smooth finish and the maximum in resilience, are features of the finished bobby pin that milady looks for. Women pay handsome premiums for bobby pins that do have all these desirable qualities. Their discriminating selection dictates the specifications of the wire. Every wire worker has a similar problem to solve in order that his operation costs may be held to a minimum and his product command as high a price as possible. He must dictate as to the specifications of the wire he uses. Wickwire Spencer will gladly listen to his dictates and follow them.

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New Broad Strip Mill of Sheet & Tube Starts Production in Record Time

BY JOHN D. KNOX
Associate Editor, STEEL

FIVE years ago a broad continuous strip sheet mill was authorized by the directors of the Youngstown Sheet & Tube Co., Youngstown, O., but construction of the unit was delayed because of general business conditions. Last year officials of the company decided to proceed with the construction. It wasn't an easy task for the engineers. The No. 1 blooming mill, a 30-inch universal skelp mill and a 12-inch sheet bar mill had to be removed to make room for the new unit and steam, water and power lines relocated without interrupting operation of other finishing mill departments at the Campbell plant.

Drafting boards were tilted at a different angle. Engineers spent hours poring over tracings, checking here and checking there. Out in the plant where for many years the old No. 1 bloomer had turned out semifinished steel, the 30-inch universal dispatched skelp and the 12-inch bar mill kept the hand sheet mills supplied—out there the wrecking crew wielded hammers and with each blow sheet iron fell off the sides and roofs of the mill buildings that were to be razed to make way for progress.

Acetylene torches in the hands of the welding crew sputtered and structural material, which had served its purpose, fell to the ground.

Soon, men were seen bending over transits, signaling with their arms as they lined up the proper elevations with the hair line of the lense.

Men hastened here and there—some with blue prints extending out of their pockets, others gesticulating with one another as they scurried about giving instructions.

Whistles blasted their shrill signals and at night flood lights mounted high in the air played millions of rays on the busy workers below.

Going Up!

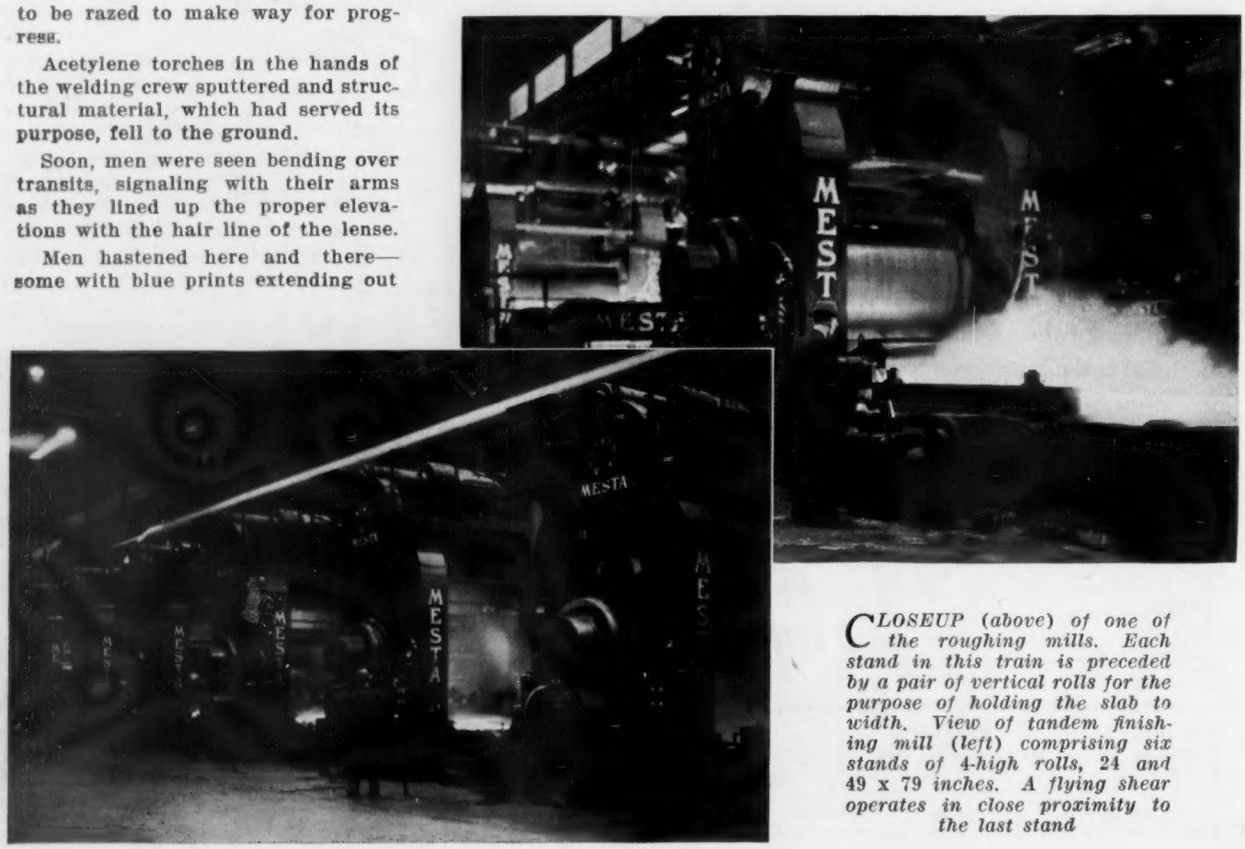
Long neck yard cranes swung structural material into an upright position. Cross members were elevated. Drift pins held them in position while skilled heaters withdrew rivets from forge fires and threw them with uncanny accuracy to the riveters waiting above with air-operated hammers ready to clinch them into the reamed holes of the structurals.

Buildings began to take form. Mill housings were moved onto their shoes. Auxiliary machinery was mounted on its foundations. Wrenches clanked as the erecting gang tightened nuts on the anchor bolts. Cranes rumbled overhead in the mill buildings as they bore their burdens to the required locations.

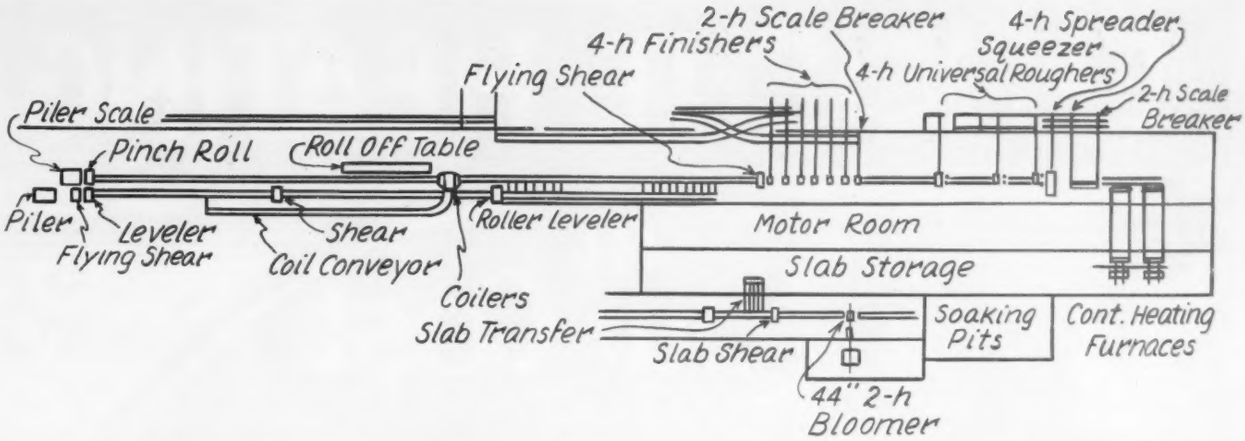
Shortly, switches were thrown. Motors began to hum. Rolls were warmed up. Gas burners at the heating furnaces roared as flames of fire swept across the hearth and put a red hue on the surface of the slabs.

Finally the great day arrived—the day when a heated slab scurrying along the conveyor tables and in and out of the bite of the various rolls would disclose how well the engineers, erecting gangs, mill wrights and pipe fitters had done their work.

Officials of the company watched from the sidelines with eagerness. Would those huge rolls now turning in their antifriction bearings and waiting to crunch red hot steel for the first time to the thickness of the gage setting—would they work successfully? Or would it be just another mill infested with "bugs" that had to be worked out before a slab



CLOSEUP (above) of one of the roughing mills. Each stand in this train is preceded by a pair of vertical rolls for the purpose of holding the slab to width. View of tandem finishing mill (left) comprising six stands of 4-high rolls, 24 and 49 x 79 inches. A flying shear operates in close proximity to the last stand



Plan view of the hot strip mill, runout and processing departments. The steel in the process of manufacture travels 1380 feet from one end of the mill to the other

would run the gamut of passes with any degree of success?

A shrill blast of a whistle reverberated through the building. The crew manning the heating furnaces and mill knew full well what it meant. As if by magic, a red hot rectangular piece of steel—a slab in mill parlance—skidded out of the one of the heating furnaces onto a conveyor and started on its way toward those massive mill housings towering 22 feet high and equipped with four rolls weighing 122 tons all ready to transform slabs of steel into such flat rolled products as strip, sheet, plates and skelp.

Officials watched the piece enter the roughing stands and come out a twisted and crooked mass of metal suitable for the open-hearth charging box.

A second blast of the whistle signaled for another slab. The roughing rolls caught it into their bite and when it was brought to rest following the last pass, observers pronounced it a reject. Little wonder that the expression on the faces of the officials was one of disappointment.

Only Three Trial Slabs

But wait. Screwdown mechanisms were seen to whirl and then come to an abrupt stop. Again the shriek of the mill whistle was heard. Another slab slid broadside over the skids onto the roller table and glided into the mill.

Countenances began to change. And rightly so. No twisting in the rolls this time. The roughed-down slab free of the last roughing pass continued on its way into the group of finishing rolls. Observers increased their pace as they followed the steel through this train from the sidelines.

On through the closely coupled finishing mills it went, and as the forward end of the piece moved over the runout table, in the form of a light plate ⅛-inch thick and 35½-inches wide, a rotary flying shear snipped it into predetermined lengths. Three trial slabs and the mill was pronounced fit for commercial production. Rather unusual for a new mill but nevertheless these are the facts.

In a little over eight months from the time construction started the hot mill was ready for commercial operation. In fact, the No. 1 bloomer rolled its last steel June 30, 1934, and the first slab was put through the new hot strip mill, which was built on the site of No. 1 bloomer, March 15, 1935.

Visitors Inspect Project

Last Monday the Youngstown Sheet & Tube Co. was host to representatives of various business papers, technical journals and newspapers. Following lunch the party was escorted on an inspection trip through the various buildings housing the new hot strip mill.

The unit is not the first of its kind built in this country. Outside of a slight change in the layout and driving mediums the new mill is practically the same as Inland's mill and others now under construction. But there is this one essential difference. A factor of safety has been built into the mill which is considerably in excess of other hot strip units.

Slabs are supplied to the new mill by the No. 2 blooming mill. Formerly eight rows of 4-hole soaking pits served this bloomer. Two rows, however, were replaced by seven holes of 1-way fired pits and one pit of the circular type. Slabs from this mill in various widths and thicknesses and cut to the required length are conveyed over a transfer table into the slab yard, 55 x 680 feet, and are piled against orders.

The charging ends of the two heating furnaces serving the hot strip mill extend into the slab storage building. The slabs in process move from storage to the furnace charging tables. Each furnace, 82 feet long and with a capacity of 50 tons an hour, accommodates slabs 15 feet long in a single row and 7½ feet long in a double row, the thickness ranging from 3 to 6 inches. As a piece is charged into the furnace it pushes out a hot slab at the discharge end onto a conveyor table leading to the hot strip mill.

The continuous hot strip mill is built with rolls 79 inches wide and will produce light plates and skelp from ¼ to ½-inch thick and blue annealed sheets 14 gage and heavier up to 72 inches wide. Hot rolled and hot rolled annealed sheets also can be produced in 15 to 16 gages up to 60 inches wide and in 18 gage up to 48 inches wide. The annual capacity is estimated at 500,000 tons.

Two Tandem Roll Trains

The mill is built with two tandem trains of rolls, the roughing train and the finishing train. The former includes a 2-high 24 x 79-inch scale breaker, a 4-high spreading stand with rolls 24 and 49 x 96 inches, a squeezer and three 4-high universal mills with the vertical rolls on the approach side and with work rolls 24 x 79 and back-up rolls 49 x 79 inches.

Several feet from last roughing stand is located the finishing mill comprising another 2-high scale breaker with rolls 24 x 79 inches and six stands of 4-high rolls, 24 and 49 x 79 inches. Immediately beyond the last stand of finishing rolls is a flying shear.

The slab in transit through the roughing mill passes through the scale breaker where hydraulic sprays at 1250 pounds pressure at the nozzles chisel the scale from the surface of the steel. Throughout the hot rolling process both sides of the slab or strip may be subjected to the ac-

(Please turn to Page 56)

EFFICIENT HEATING

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IS PRODUCTION IN YOUR MILL BEING HELD UP BY POOR HEATING?

In many cases not only a slowing up of production but an output of an inferior grade of steel is directly traceable to inefficient heating equipment.

With a background of more than 25 years of successful engineering and development, the Flinn & Dreffein Co. have developed for the Steel Industry many efficient Continuous Heat Treating units now available.

The opportunity to study your heating problems and quote on your furnace requirements will be appreciated.

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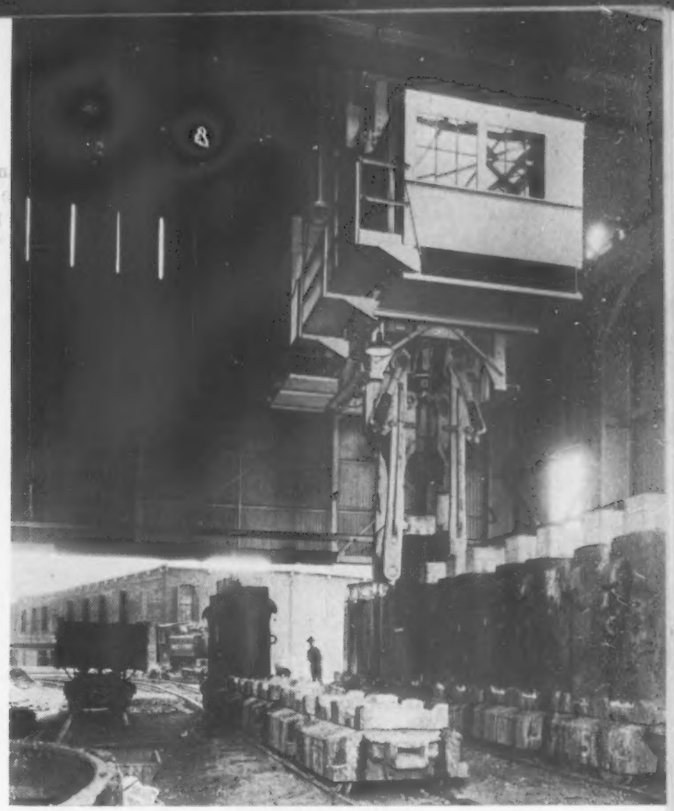
Warren, Ohio

Steelworks Installs New Soaking Pit and Crane Equipment

BY L. E. BROWNE
Associate Editor, STEEL



STRIPPER and soaking pit crane designed to handle all types of steel ingots. Stripping pressure of 150 tons and lift load of 15 tons is provided

IN THE manufacture of high grade steels for a wide variety of products, soaking pit practice and equipment are of primary importance. This is especially true at steelworks producing fine wire, specialties and materials entering into the manufacture of finished goods requiring uniformity in specifications, both as to analysis and treatment. In such works, production, while important, is not paramount. Quality comes first, with ingot soaking practice a key operation from the open hearth to shipping platform.

The American Steel & Wire Co. recently has completed installation at its South works, Worcester, Mass., of two four-hole soaking pits, an ingot stripper of new design to handle all types of ingots, charging crane and other equipment giving close control of heats and allowing a maximum of efficiency in handling. The department is housed in a new all-steel building designed for the particular equipment installed.

The oil-fired soaking pits are of the one-way fired, or recuperative type, as compared with the conventional reversing-regenerative pit. The one-way fired type of soaking pit has already been installed in ten different plants in the steel industry, installations including a total of 66 holes.

From the standpoint of efficient combustion of the fuel, this type of pit provides for one firing port in contrast with the reversing pit, the firing port of which alternately becomes a waste gas port as well as a firing port. In the case of the one-way fired pit, the firing port is designed for maximum combustion efficiency. Material reduction in the fuel consumption and ingot scale formation is claimed possible. Furthermore, because of the location of the firing port, the combustion of the fuel is well above the top of the ingots, thereby preventing direct impingement of the flame upon the ingot surface.

Preheating with Recuperator

The design of the pit built at Worcester is such that the firing port is located in the rear wall and fires toward the front wall. The products of combustion then turn downward and pass longitudinally toward the waste gas outlet located in the rear wall, below the firing ports. Path of the gases within the hole therefore resembles a vertical horseshoe. The length of this horseshoe is controlled by the draft imposed on the hole. Therefore, the high temperature products of combustion are distributed along the longitudinal axis of the hole, adjusted to the ingot heating requirements. The ingots are usually arranged in two rows along the longitudinal axis of the hole.

Waste gases, leaving each hole, pass through the horizontal waste gas flues of a three-pass refractory tile recuperator. The air for combustion enters the recuperator at the bottom through a control damper, and passes upward through vertical flues in the tile to a collecting flue, where it passes, through suitable ducts, to the firing ports. Because of the height, as represented by the distance from the air inlet of the recuperator to the firing port, there is established an internal stack, which creates a flow of the air sufficient for combustion at the firing ports with a static pressure of from 0.1 to 0.2-inch water column. The degree of air preheat required determines, of course, the size of the recuperator. At Worcester, the recuperator is designed for an air preheat of 1000 degrees Fahr.

The waste gas from each of the four holes passes to a common flue and from there to a self-supporting brick-lined steel stack, 5 feet 6 inches inside diameter, brick lined and 100 feet high. The draft on each soaking pit, as a whole, is controlled by a main stack damper, while an individual damper, installed in the flue leaving each recuperator, controls the draft on each hole.

Soaking pit covers are of the suspended flat-arch type. These covers are insulated and suspended from their carriage by means of four adjustable swing bolts, one on each corner of the carriage. The covers are carried on cast steel rails and are driven by a mill-type direct-current motor, mounted on top of the cover, which drives the cover by means of a suitable worm and gear speed reducer and sprocket and chain drive to the axle. Flexible cables to each motor transmit the power from takeup reels located at the rear of the pit platform, where are also located the necessary electric controllers.

A control board has one panel for each hole, upon which is mounted the fuel control valves, control handle for regulating the air inlet damper and position dial, individual hole waste gas damper with position

dial, and control handle regulating the primary air to the oil burner. A master panel is also provided, upon which is mounted an automatic main stack damper control and gages for indicating oil and primary air pressures. By such an arrangement, each hole is separately controlled, which lends itself to maximum operating efficiency from the standpoint of fuel economy and ingot heating. All soaking pits are reinforced with substantial structural steel and are encased with steel plate. The pit walls, as well as the hot air ducts of the recuperators, are lined with 4½ inches of insulation.

Oil Is Conditioned

A central oil conditioning station, comprising local storage tank, motor driven pumps, oil heaters and automatic temperature control thermometer, is provided on the ground floor, in plain view from the operating platform. Oil meters located at the control board record the consumption of each battery of pits.

All electric control equipment, involving the pit covers, blowers, oil pumps, incoming power feeders and lighting circuits, is located in a control room on the operating platform.

The stripper crane is an entirely new development, being the first installation to take care of all types of ingots. It is designed for a nominal stripping pressure of 150 tons and to lift a load of 15 tons.

Stripping mechanism is of the screw type with alloy steel screw, right- and left-hand threads, so arranged that stripping pressure is self-contained and cannot be exerted on the cars.

The trolley, a one-piece steel casting, is of the latest mill type construction, with all motions worm driven and roller bearings used throughout. All motions on the bridge and trolley are controlled by magnetic switch control.

The soaking pit charging crane is designed for charging and drawing ingots up to 7½ tons, with an auxiliary 5-ton hoist. Ingots are taken from cars after being stripped, and charged into the soaking pits. After proper heating, they are taken from the pits and placed in a buggy, which carries them to the bloomer and dumps them. This crane is of the same general construction as the stripper, all motions on the trolley being worm driven except the tongs turning. The crane is the low-type design, wherein the tongs mechanism is mounted in a one-piece steel casting, which is hoisted and lowered by ropes. This construction permits the extremely high lift necessary for this installation, without the necessity of unreasonably high headroom above runway.

The bridges of both cranes are roller bearing throughout, double drive, with outrigger girders to assist in carrying the motors, lineshaft and footwalk. Cranes are of 70-foot span. They are provided with centralized system of lubrication and meet exacting safety requirements.

Steel Signals Warn

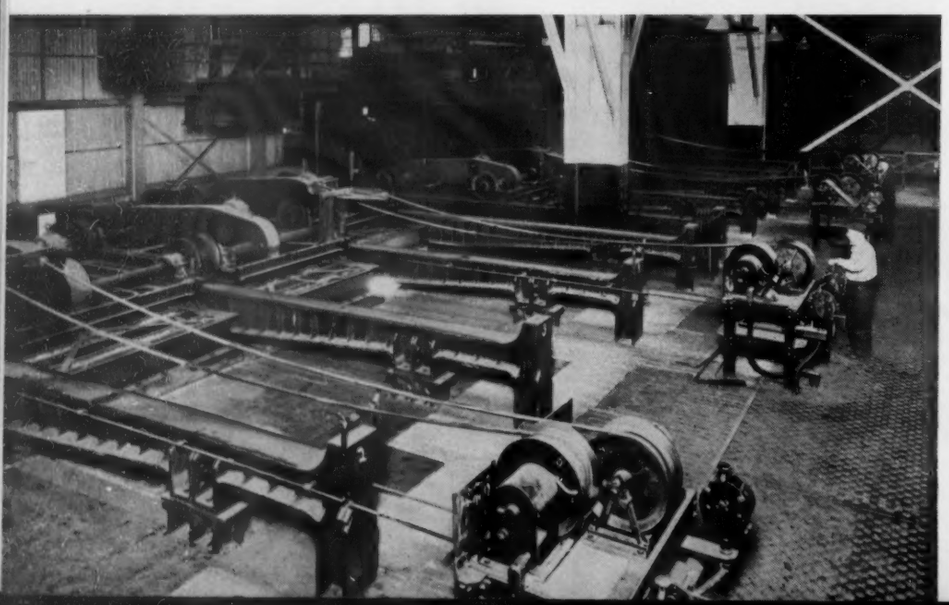
Steel sheets, and bars and malleable castings are used in the manufacture of a new line of safety signals being marketed by Martindale Electric Co., Lakewood, Cleveland. The new units include signs and red flags, together with standards for displaying them. The signs carry warnings such as "Men Working," "Do Not Touch" and "Keep Out." They are stamped and formed from steel sheets and finished with baked yellow enamel. A malleable casting holds the tripod and standard, made of ½-inch round steel bars. Surmounting the standard is a malleable socket for holding the flag. The entire standard, finished with red paint, air dried, weighs 7½ pounds

A.I.M.E. Iron and Steel Papers Are Published

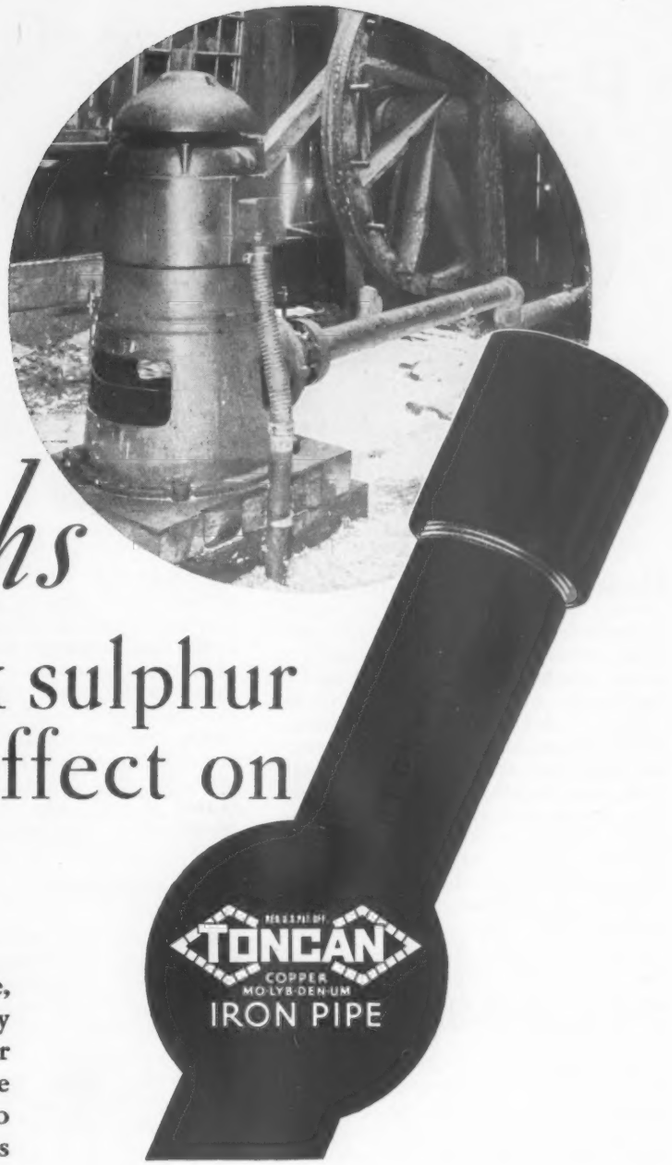
Transactions A.I.M.E., 1934, cloth, 299 pages, 6 x 9 inches; published by American Institute of Mining and Metallurgical Engineers, New York; supplied by STEEL, Cleveland, for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Papers and discussions of the iron and steel division of the American Institute of Mining and Metallurgical Engineers presented at the meetings in Detroit, October 4-5, 1933, and in New York, February 19-23,1934, are included in this volume, the seventh in a series containing such material.

Seventeen papers are included in the volume, all but four accompanied by discussion which followed their presentation. They include the Howe memorial lecture on the corrosion problem with respect to iron and steel; recent trends in blast furnace operation and design, basic open-hearth bottom-cast practice and iron oxide control, determination of oxygen and other gases in steel, effects of columbium, titanium and chromium in steel, and other subjects.



OPERATING platform for two four-hole one-way fired soaking pits. Flat arch type insulated pit covers are used



16 months

in vicious black sulphur water had no effect on

The Sharples Solvents Corporation, Wyandotte, Mich., put down a well and found that the only water available was a quite vicious black sulphur water. Ordinary pipe used in the discharge column and shaft of the air lift equipment had to be taken out and replaced three or four times a year.

Then Toncan Iron Pipe, installed by the Sterling Pump Co., South Bend, Ind., was given a trial because of its past performance where corrosion was a factor. In December, 1934, the pump was pulled for the purpose of inspecting the pipe. The results were surprising—after 16 months of service no noticeable deterioration could be found, and the original pipe was reinstalled without a change of any kind.

This is typical of the performance of this modern alloy of refined open hearth iron, copper and molybdenum wherever severely corrosive conditions are encountered. You can read all about Toncan Iron Pipe and its records in industrial service in "Pipe for Permanence." Ask for a copy of this interesting book.

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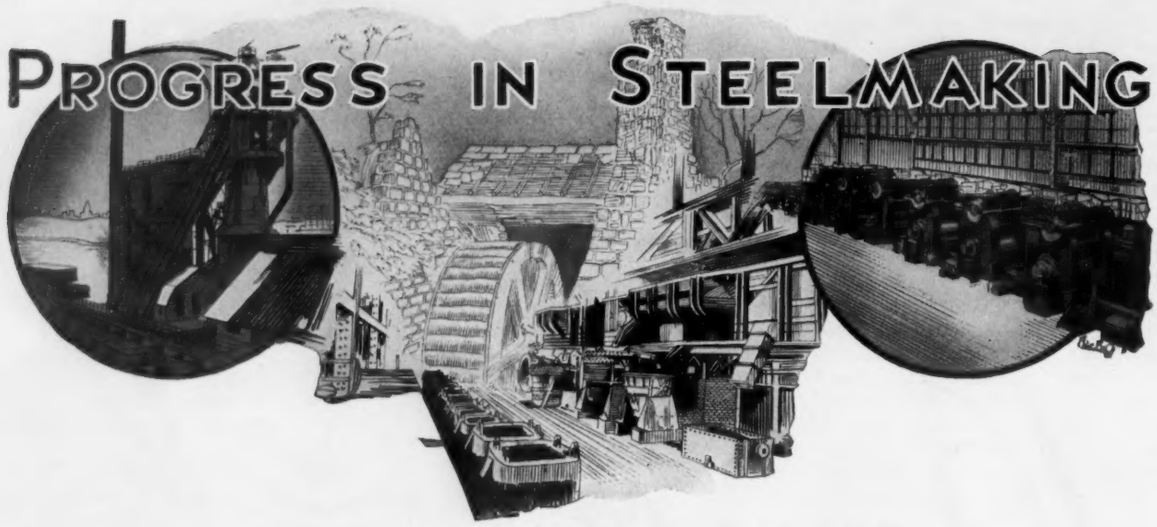


Floor Is Made Acidproof

Surfacing concrete floors and walls in pickling departments with a single course of brick for tile and a membrane of asphalt between the cement and brick provides an acidproof lining. Floors of this type construction cost about $0.60 per square foot and require no further attention. In case of heavy trucking, the brick should be laid on edge and a water-resistant acidproof is much used. This type construction also is suitable for pickling tank drains and sewers.

♦ ♦ ♦

New Lamp Aids Lighting

Improvement in high bay lighting at various departments of steel plants is had through the use of a newly marketed high-intensity mercury vapor lamp which is restful to the eyes. The lamp has an overall length of 13 inches and is designed for operation on 110 and 220-volt, 60 cycle circuits. It has an average life of 1500 hours.

♦ ♦ ♦

Requires Care in Handling

Ore crane operators should exercise considerable care during cold weather owing to danger inherent in scooping frozen ore. Recently a Pittsburgh district blast furnace operator in attempting to scoop frozen ore caused the complete collapse of the large ore crane itself.

♦ ♦ ♦

Brake Is Smooth Acting

Controlling all hoists, cranes, winches and similar equipment at iron and steel plants is facilitated by a recently devised compact and smooth-acting disk type electric brake. The device is similar to an automobile clutch of the multipole disk type. Braking pressure is applied whenever the motor power-supply is interrupted by an adjustable calibrated helical spring which forces the nonrotating disk against the rotating ones splined to the motor shaft. The breaking torque thus caused is removed, when voltage is reapplied to the motor, by a magnetic system, which compresses the spring and releases the pressure against the disks, allowing the shaft to rotate freely. The design of the magnetic system provides for only a small air-gap which limits the in-rush-current and, therefore, the power consumed by the brake. The small air-gap permits the disks to travel only a short axial distance, resulting in a smooth action of the units. This design also permits the use of a greater area of braking surface operating at lower pressures than is the case with the conventional shoe-type brake.

MOST OF US often wonder what this or that steel plant is doing in the way of improving its practice. There was a time when we did more visiting but lately conditions keep us close to our work.

We can make these visits by proxy, however, for every week, in this section, STEEL, takes you in many plants and gives you the opportunity of securing profitable ideas in a fraction of the time it would take you to secure them yourself.

If you desire further information on any idea, announcement, lead or suggestion presented, please write us. Perhaps you know of an idea or "shop wrinkle" that has effected a reduction in operating costs at your plant. If so, won't you send it along?

The Editors

♦ ♦ ♦

Resists High Temperatures

A new brick which shows greater density even than the deaired brick, and which is claimed to resist higher temperatures and show less spalling recently has been placed on the market. This brick is expected to find wide usage in the first pass of multiple,pass checkers and in the top courses where checker brick shows fusing or fluxing from deposits of flue dust.

♦ ♦ ♦

Uniform Heating Results

Temperatures of seamless tubes emerging from the piercing mill are measured by a producer in this country by a photoelectric pyrometer. A graphic record of this temperature serves to show quickly whether the billets are heated properly. More uniform heating and consequently a better product from this mill has resulted from this close check of the temperature.

♦ ♦ ♦

Handles Heavy Plates

Bending, flanging, forming and multiple punching of plates will be accomplished by an Eastern steelmaker by one of the largest presses of its type ever built. The machine, which will handle plates up to 1-inch thickness, in lengths up to 12 feet; and up to ¾-inch thickness in lengths up to 18 feet, weighs about 145,000 pounds. Many of the parts are made of nickel alloy steels.

Rolling Mill Bearings Discussed by Iron and Steel Electrical Engineers

MAINTENANCE of roll neck bearings is not exclusively a function of the mechanical department, but must also be considered by the engineering, operating, and executive departments, stated H. D. Robb, Pittsburgh district manager, Timken Roller Bearing Co., Canton, O., at the opening session of the spring engineering conference of the Association of Iron and Steel Electrical Engineers held at the Ohio hotel, Youngstown, O., Wednesday evening, April 24, under the auspices of the combustion engineering division.

Mr. Robb pointed out that the size of the bearing is closely related to its life, and the economic balance between life, cost, and maintenance must be decided by the management before the bearing is ordered. He recommended rolling under pressure control rather than gage reduction alone. Doubling the bearing load decreases the bearing life to one-tenth the normal expectancy, while reducing the bearing load to one-half increases the life ten times.

Care Needed in Handling Bearings

On the first indication of bearing trouble, he explained, the bearing should be removed for examination. Immediate attention usually enables a simple repair to be made, such as replacing a roll or touching up a spalled spot. The maintenance department should be authorized to issue instructions that a damaged bearing be removed from a roll neck before it is a complete wreck.

Care should be exercised to see that wedges are so assembled that the chocks on the floating side are free to find their own centers. He suggested that chocks be built so as to follow the deflection of the rolls, experience showing that the flat on the bottom should give from 15,000 to 20,000 pounds per square inch and that the bottom of the chock be beveled on a taper to 1/16-inch at the end of the chock.

Spare bearings should be available. Some should be mounted at once to facilitate roll changes. Those not mounted should be stored in a clean, dry room not subject to acid fumes. Care should be exercised in handling bearings, as they are precision products. In conclusion the speaker recommended a periodic bearing inspection to accomplish the four-fold purpose of:

1. Removal of contaminated lubricant.
2. Replacement of fatigued rolls and the shifting of maximum load area by rotating the outer races 90 degrees when replacing them.
3. Adjusting for wear, an average maximum clearance of 0.001-inch between rolls and races being recommended.
4. Reduction of roll neck scoring, an instance being cited where a six months period showed a wear of 0.006-inch, but a nine month period showed 0.015-inch.

POSITIVE alignment of 4-high rolls can be assured by the use of a simple and ingenious self-aligning device described by J. H. Hitchcock, engineer, Morgan Construction Co., Worcester, Mass. Each work roll bearing is mounted between parallel wedges, so arranged that axial movement of the roll changes the alignment of the roll axis. No restraint whatever is imposed upon the work roll bearings with respect to endwise movement, he contended, except that in moving they must follow the slightly diagonal paths established by the parallel degrees. The bearing casings are fitted at the sides with hardened steel plates having cylindrical outer surfaces. These cylindrical plates may be permitted to bear against the wedges themselves, in which case the wedges should be hardened; or auxiliary plates having cylindrical seats may be interposed to provide a wider surface of contact.

The operation of this self-aligning device he explained is based upon the principle that the forces which result from misalignment can be used to align the rolls properly. From the foregoing statements it is evident that no appreciable axial force can be applied to the work roll without causing it to move endwise, carrying its bearings along between the parallel wedges. This endwise movement and the accompanying change of alignment, if the inclination of the parallel wedges is properly established, places the work roll in accurate alignment with its respective backing roll and eliminates the axial force which initiated the movement. This device, he cautioned, is not applicable to 4-high reversing mills, nor to the small middle rolls of 3-high mills which roll in both directions. When the direction of rolling is reversed, the direction of the axial force due to misalignment is likewise reversed; so that the endwise movement of the work roll and its bearings, instead of correcting the misalignment, would accentuate it.

After conducting comprehensive experiments and applying for patent protection, the Morgan Construction Co. last year placed this self-aligning device in active operation on a small 4-high cold strip mill which likewise is equipped with Morgoil bearings. This unit has operated consistently in a most satisfactory manner, and has demonstrated in practice the advantages of positive roll alignment.

Clamp Aids Alignment

Another useful device which has been developed for use with Morgoil bearings on 2-high mills is the adjustable bearing clamp. This device is designed to permit precision axial alignment of passes on mills rolling shapes. With these bearings all axial thrust loads in both directions are absorbed by a double acting thrust bearing built into the bearing on the working end of the roll, so that no clamps on the drive side of the housing are necessary.

The clamping device is constructed with two pairs of jaws hinged to heavy brackets attached to the housing posts. The jaws of the upper pair act on the outer face of the ears on the bearing casing, while the lower jaws engage the inner face. The jaws of each pair are connected together by a heavy turnbuckle. Axial adjustment of the roll is readily made by slacking off on one turnbuckle and taking up on the other, or vice versa. Inasmuch as one turnbuckle is always in tension while the other is always in compression, all backlash in the hinge pins is eliminated and positive alignment can be maintained.

PERFORMANCE and upkeep of roller bearings on roll necks are closely related to the design of application and all details must be based upon a sufficient degree of practical experience, according to G. Palmgren,

chief engineer, SKF Industries Inc., Philadelphia. In the first place, he stated, the design must provide for a sufficiently strong mounting. In order to know if the bearings are strong enough it is obviously necessary not only to determine the loads and all variations of loads, but also to have complete knowledge of the relation between bearing load and bearing life and how the variable load will affect the bearing life. If this part of the problem has not been handled properly from the start it is useless to discuss maintenance because even the best maintenance cannot eliminate mistakes in bearing design.

Some years ago it was considered that 400 revolutions per minute was the limit for a loose fit application, but today we are in a position to recommend loose fit mountings up to 1200 revolutions per minute.

Factors in Loose Fit Mountings

The basic principle for the successful performance of a loose fit application is that an oil film is created and maintained on the bearing seat. This oil film can be formed from an oil supply located in a central bore of the neck, which can be replenished at each roll change, and experience has shown that in a 14-inch merchant mill at about 100 revolutions per minute, this oil supply will last 200 hours. At high speeds, as, for instance, in the finishing stands of a continuous rod mill, it is recommended that the rolls be connected with an automatic lubricating system to insure a predetermined amount of oil or grease to be forced under the bearing at regular intervals.

Another feature of the design which indirectly is related to the maintenance of the roller bearing application, is the locking device. Where frequent roll changes take place the method of locking should be such that it is simple to handle, and also subjected to the least possible wear. The speaker recommended the use of a tapered wedge which goes through the roll neck and contacts a slotted spacer ring which is forced up against the inner race of the bearing.

Another locking device is featured in a skeleton sleeve which is locked by a nut at the center of the wobbler and which allows the muff to be pushed on the wobbler without interference from the locking sleeve. This design has proven extremely convenient for such applications which refer to changeovers of existing mills where the existing roll necks were too short to allow any other locking arrangement.

SUPPLEMENTING Mr. Robb's paper on "Maintenance of Roll Neck Bearings" S. F. Keener, Salem Engineering Co., Salem, O., described equipment for rejuvenating roll neck bearings.

Spurred by the increasing use of roller bearings in rolling mills and the increasing size and initial cost of these bearings, he pointed out, a considerable metallurgical research has been carried out which has developed the fact that the life of these bearings can be somewhat prolonged by a low temperature heat treatment at regular intervals.

Briefly, this treatment consists in heating the bearing to between 325 and 350 degrees Fahr. and holding at temperature for two hours per inch of maximum cross section of the bearing. The interval between treatments is from three to six months.

The type of equipment selected to most satisfactorily meet these conditions in this particular case was an electrically heated oil bath. Such a furnace was installed by the Timken Roller Bearing Co. for this purpose. An illustrated description of the unit was presented in the Feb. 11, 1935, issue of STEEL.

Numerous problems are involved in the successful design of such equipment, he stated. The oil found to be most satisfactory as a heating medium has the specifications:

Neutral paraffin base 28-29 degrees Baume
Viscosity 100 seconds at 100 degrees Fahr.
Flash point 375 degrees Fahr.
Fire point 425 degrees Fahr.

How Rejuvenating Furnace Operates

In order to insure uniform temperature on all parts of the bearing, a circulation of the oil is essential. This is accomplished by a motor driven fan in conjunction with baffles to direct the oil circulation upward past the heating elements and down through the heating material.

The arrangement of the electric heating elements is around the outside walls of the pit. The binding of the furnace consists of a double steel shell filled with insulating material. A removable cover of substantially the same construction is provided for access to the furnace when charging and discharging rolls. The rolls are supported on a heavy structural supporting rack in the bottom of the furnace.

The economy, or electric energy consumption of the rejuvenating furnace depends upon the rate of heating. The records for the initial furnace which was 66 inches diameter by 37 inches deep effective loading volume, indicate an average production of 1000 pounds of bearings heat treated per hour, with an energy consumption of 2.7 kilowatt hours per 100 pounds, or 54 kilowatt hours per ton. On the same furnace the best production recorded was 3000 pounds per hour, with an energy consumption of 1.1 kilowatt hours per 100 pounds, or 22 kilowatt hours per ton. The furnace can be heated from cold to 350 degrees Fahr. in 12 hours, and has a connected load of 25 kilovolt amperes.

In conclusion, the speaker said that this heating device, when properly designed, offers the best method so far developed for carrying out the metallurgical process of roll neck bearing rejuvenation, developed by the Timken Roller Bearing Co. for prolonging the life of mill type roller bearings. The important result of the process utilizing this equipment is a reduction in the maintenance cost of rolling mill bearings.

IN SPEAKING on "Influence of Roll Neck Deflection on Life of Anti-Friction Bearings," A. H. Frauenthal, Bantam Ball Bearing Co., South Bend, Ind., mentioned that roll diameters already have reached the point where their production in the foundry is a major problem. He made it clear that if roll neck bearings can be arranged so that the entire bearing instead of only a small portion is operative, much smaller bearings can be used to give satisfactory life. Likewise, life will become extremely long with the large size bearings in use on the most modern mills.

An examination of bearings that have been in service especially on bottom rolls, he explained, shows that the greatest portion of the rolling load has been carried on a short length of the bearing. This short length is located toward the inside of the mill and is the portion of the bearing nearest the roll barrel.

The reason for this lies in the fact that the rolling load produces a considerable deflection in the roll body and especially in the roll neck, with the result that if the bearing housing does not self-align the load is carried on the edge of the bearing nearest the roll body.

This condition now is recognized so universally that various devices have been tried to provide some means for self-alignment of the chock to bring the angle of the bearing coincident with the angle of the neck.

Friction Load Is Too High

In outlining a method of construction for heavy mills Mr. Frauenthal mentioned two self-aligning bearings mounted on the same neck. To obtain self-alignment of the chock it is necessary for the outer races to move endwise against static friction under load.

For a chock to self-align it is necessary in every case to overcome static friction under the mill load and he emphasized in every case the friction load is far too high.

For a bottom chock to self-align it is necessary for the bottom to move outward and this only can be

ADVERTISING PAGES REMOVED

accomplished by anti-friction means, he continued.

Such a device has been developed by the Bantam Ball Bearing Co., South Bend, Ind., and consists of a single roller located between hardened plates on the center line of the bearing transverse to the axes of the rolls.

This roller permits the outward motion of the load side of the chock and the tilting of the chock to produce an angularity of the bearing and its housing to exactly compensate for the angularity of the roll neck. The bearing center is not displaced; the chock clamp can be placed at a neutral point where it will not interfere with the action.

Because of the antifriction nature of the device, he stated, it will be impossible to place a heavier load on one end of the bearing than the other without tilting or self-aligning the chock.

This should be borne in mind particularly when it is further considered that the curvature of the roll neck as well as the angularity tends in the conventional mounting to concentrate the load on the bearing.

A secondary advantage of the roller aligner, he explained, lies in its permitting expansion and contraction of the roll to take place on antifriction motion.

Factors in Bearing Troubles

In taper bearing mountings one chock is allowed to float or the inner races are floated on the neck. In either case expansion and contraction takes place by a sliding motion. In the case of most straight roller bearing mountings the sliding is endwise across the rollers.

While smaller in the case of straight roller bearings, the sliding friction involved introduces temporary heavy thrust loads.

This is eliminated with the roller aligner and should result in an increase in life particularly with taper bearings where the thrust load is so greatly magnified when converted to radial load.

In all cases the plates and rollers are hardened and ground Bantam high-carbon chromium electric furnace steel.

The top plate is set in a groove in the chock and held in position by a small clamp at each end engaging a groove in the end of the plate. The bottom of the chock extends below the rolling surface of the plate to protect it when the chock is standing on the floor.

The bottom plate is set on the bottom of the housing window and held in position sideways by the machined castings which also hold the centering springs.

These centering springs and plungers simply are to hold the roller in a central position during mounting of the roll and chock into the mill and are so constructed that they permit the roller to move in either direction.

The roller is held in a cast bronze cage which is so designed as to hold lubricant around the roller in the standard Bantam lubricage design and has a flange extending over the end of the bottom plate to limit endwise motion of the roller.

While the essential purpose of this device is to permit antifriction self-alignment for the roller bearing, the roller can be designed to act as a safety device or breaker in case some accident temporarily throws the full horsepower of the drive or screwdown motors into the mill.

While it is only possible at this time to give a preliminary report on the success of this device, it is interesting to note that readings taken with dial indicators show that under heavy loads chocks equipped with the Bantam roller aligner will self-align to an angle equivalent to 0.010-inch per foot, whereas the same chocks with a conventional mounting and under the same load did not self-align.

This measurement, the speaker pointed out, was taken on a wide mill. Similar measurements taken on a 24-inch mill showed a maximum chock angularity of 0.0125-inch per foot. This indicates that any greater stiffness in a narrow mill does not react to the advantage of the bearings as far as load distribution is concerned and the roller aligner is just as necessary on a narrow mill as on a wide mill.

Investigation of some of the latest 4-high broad strip mills has shown rigid top mountings with consequent load concentration on the bearings. Under these conditions, the speaker advised using the roll aligner on top as well as on the bottom chocks.

Steel mill records show that there is much less trouble with bearings that are used continuously on top rolls as compared with bearings continuously used on bottom rolls. The speaker explained that this condition is due to better load distribution obtained on top rolls than on bottom rolls with conventional mountings.

It has been stated that on top rolls, due to their positions, little, if any, water and dirt gets into the bearings, whereas on the bottom bearings the water can run in by gravity and the majority of it will get into the inside end.

Roller Aligner Beneficial

Bottom bearings have more load because weight of roll and chocks must be added to load on bottom bearings whereas this dead weight is deductible from top bearings.

An examination of bearings operated on both bottom and top rolls under many different conditions and many different mills indicates the fallacy of the water and dirt theory. It is clear that the damage to the bearings is done by load and not by corrosion and dirt. The difference in appearance is very clear.

Dead load is small as compared to rolling load and the additional dead load could not possibly account for the much more rapid wear of bottom bearings as contrasted with top bearings.

A further indication that deflection is chief cause of failure is shown by the fact that changing chocks from plain flat bottom to knife edge did to some extent ameliorate conditions.

Consolidating present experience, he said, we come to the following conclusions:

Roll neck bearings fail mainly because of poor load distribution.

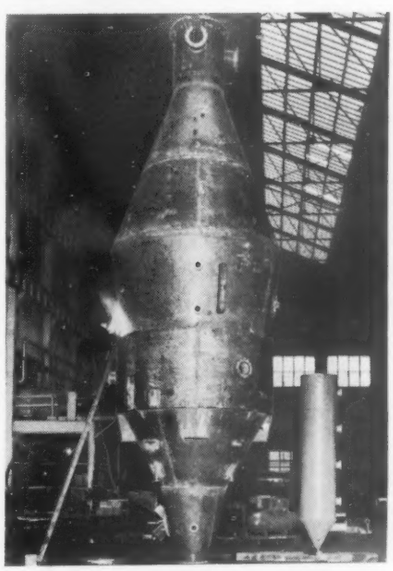
Many top roll mountings are favorable because of their flexibility.

No past method of bottom roll mounting permits self-alignment due to friction conditions.

The Bantam Roller Aligner accomplishes self-alignment and good load distribution by its anti-friction character.

(To be continued)

Salt Drier



IN THIS HUGE EVAPORATOR wet salt is stirred up by a bronze propeller and circulated through 828 copper tubes in which the water is distilled off. Designed by Clinton S. Robinson & Associates, Chicago, it is 50 feet long and 12 feet in diameter across its widest section. It was built by Wellman Engineering Co., Cleveland, of ⅝ and ¾-inch steel plates; mild steel, it is stated, stands up satisfactorily in contact with the salt in this application. The finished evaporator weighs 25,000 pounds. To demonstrate its rigidity, the structure is shown standing on end. All joints were made by arc welding. Photo courtesy Lincoln Electric Co., Cleveland

NEW EQUIPMENT

Liquid Mixers—

Patterson Foundry & Machine Co., East Liverpool, O., has added a new model to its type E line of mixers, using the style TD stirrer shown in the accompanying illustration. While many mixers using this principle have been built as special machines, they now have been standardized and their manufacture placed on a production basis. They are provided

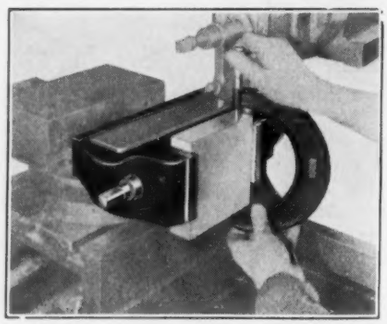
Patterson mixer, formerly built as special machine, now being manufactured on production basis

with cast impellers, of any desired metal, and are furnished with flat or dished bottoms, jacketed or plain. They may be equipped with the company's unipower drive or may be arranged for belt drive.

♦ ♦ ♦

Arc Welder—

Hobart Bros Co., Troy, O., has introduced a new 75-ampere arc welder, similar in design and construction to larger models, but rated at 75 amperes and 25 volts, built specially for light-gage welding. It has welding range of 15 to 125 amperes in three steps. Power is supplied by a 3-horsepower motor. The unit is equipped with starting switch, polarity change switch, dual re-



New shaper vise attachment by National Machine Tool Co., facilitates end-shaping operations

mote control, double reading voltmeter and double reading ammeter. It is provided with convenient lifting eye on top and in the portable type (see illustration) is bolted to a welded steel truck with four steel disk wheels and drawbar.

♦ ♦ ♦

Shaper Vise Attachment

National Machine Tool Co., Racine, Wis., has developed a new, patented, shaper vise attachment, shown in the accompanying illustration. By its use long pieces can be end-shaped to positive squareness and length. It permits taking overall dimensions with micrometer or vernier without

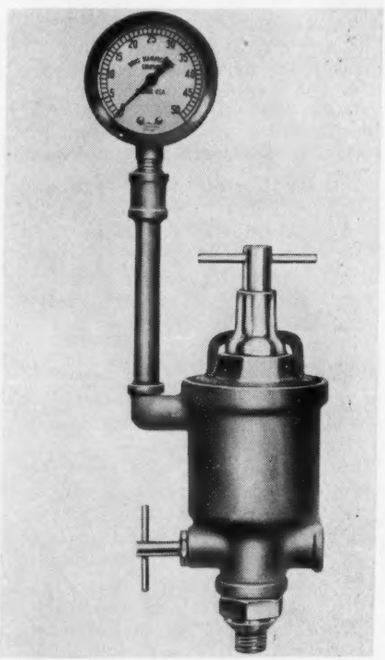
Portable model of new 75-ampere Hobart Bros. arc welder, designed for welding of light-gage metal

removing the work from the vise. It permits changing from end-shaping to ordinary shaping without changing the position of the vise and without raising or lowering the main table. The company claims that the new device effects important savings through elimination of costly set-ups.

♦ ♦ ♦

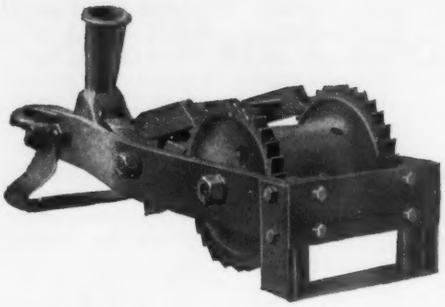
Paint Spray Regulator—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, has designed a material regulator which is claimed to permit accurate control of paint con-



Binks all-metal regulator for control of spray painting operations

sumption in spray paint handling systems. Shown in an accompanying illustration, the regulator is installed at each point on the paint pipeline where a tap is taken off for a spray gun. It can be set with a removable key, determining precisely the amount of paint each gun will receive. Paint viscosity, once determined, can be adhered to rigidly. The regulator is claimed to deliver paint under correct uniform pressure and to permit application to the sur-



New Pierce-Miller jack for moving buildings and machinery, pulling boiler tubes, stretching fence and cable and performing numerous other similar tasks

face in uniform thickness. It is of all-metal construction and is unaffected by solvents.

♦ ♦ ♦

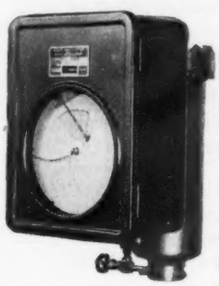
Pulling Jacks—

Pierce-Miller & Co., Brazil, Ind., announce the development of a new, heavy duty pulling jack, illustrated herewith, for moving buildings, machinery, boilers, well casings, boiler tubes, for tightening guy ropes, stretching fence and cable, spotting cars, putting up structural steel and performing many other similar tasks. It is 36 inches long, of steel construction, with chromium alloy steel pawls and weighs 100 pounds. It is operated manually.

♦ ♦ ♦

Fuel Flow-Air Flow Meter—

Bailey Meter Co., 1050 Ivanhoe road, Cleveland, has developed a new fuel flow-air flow meter for furnaces and kilns to assist in obtaining maximum combustion efficiency. At the time the meter is installed, a combustion test is made to determine the ratio between fuel and air flow which is best. After this is determined, the air flow mechanism of the meter is adjusted so that the two records coincide, one upon the other, when conditions are reached. The meter is mounted in a pressed steel casing, for either flush front or surface mounting. The integrating mechanism requires a supply of alternating current with regulated frequency, although a spring driven clock can be supplied for this purpose. The meter has been designed so that auxiliary recorders of temperature of pressure may be included to record on the same 12-inch diameter chart with the flow record.



♦ ♦ ♦

Motor and Compressor—

Dumore Co., Racine, Wis., recently brought out a combination motor and compressor designed primarily for the spraying of paint and also lacquers. The aircooled motor has a 1/10-horsepower rating, and is of the universal type, operating on either alternating current, 0 to 60 cycles, or direct current. The compressor part of the unit develops a dead end pressure of 20 pounds, while a check on the air velocity of these motors show it to be 650 feet a minute at the ¼-inch discharge vent. The unit weighs 3¾ pounds.

♦ ♦ ♦

Protected-Arc Welder—

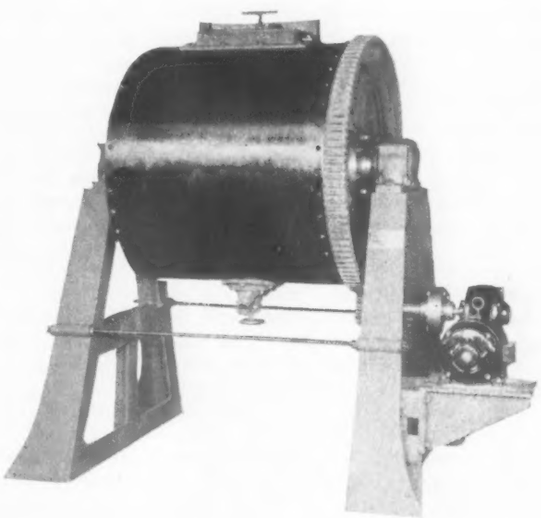
USL Battery Corp., Niagara Falls, N. Y., is marketing a 300-ampere protected-arc welder, powered either by belt, electric motor or 6-cylinder gasoline engine. As shown in the illustration herewith, the unit is fully enclosed, giving protection against dust, moisture and falling objects. Welding range is 90 to 375 amperes, open circuit voltage 25 to 80 volts. Built-in stabilizing coils facilitate welding of both light and heavy material efficiently. The unit is mounted on a welded steel truck, with removable steering handle.

Generator capacity has been increased in this 300 ampere protected-arc welder built by USL Battery Corp.

♦ ♦ ♦

Ball Mills—

Crossley Machine Co., Trenton, N. J., has developed a new line of ball or pebble mills known as style D, specially adapted for grinding and mixing enamels, paints, lacquers, flint, spar or any other materials in which the finished product must be finely ground. Dry ground materials are discharged through the screen door which retains the pebbles in the mill. For liquid materials the company furnishes a specially constructed door which permits free flow of the liquid material through a discharge valve, retaining the pebbles in the mill. The new mills are available in sizes having dry sand capacity of 50 to 5900 pounds.



New Crossley ball mill for fine grinding, both dry and wet, of enamels, paints, lacquers, flints, spar and other materials

Broad Strip Mill Makes Record Start

(*Concluded from Page* 43)

tion of the sprays five times. From the scale breaker the slab passes into the spreading mill equipped with rolls 96 inches wide, or 15 inches wider than those used in the roughing and finishing trains. Slabs longer than 7½ feet pass through the spreader lengthwise. Slabs 7½ feet long however, before entering the spreader pass are turned 90 degrees by a turntable and are fed broadside into the rolls which have a capacity for spreading through a range of 42 to 72 inches. The piece is received by a turntable on the delivery side, turned 90 degrees and fed lengthwise into the first stand of 4-high universal roughing rolls. The piece never is in more than one stand of roughing rolls at the same time.

Temperatures at which the piece is finished to gage are highly important from the quality standpoint. Some of the passes on the roughing mill effect a 45 per cent reduction and to do this successfully the steel must be at the proper temperature to flow under pressure. But upon leaving the roughing train the temperature may be too high for entering the finishing mill. Hence, between the roughing and finishing trains a cooling space is provided for controlling the temperature of the steel.

Before entering the first stand of finishing rolls the piece passes through a scale breaker and then runs the gamut of finishing passes. At the delivery end of the finishing mill and within close proximity to the rolls is a rotary flying shear which cuts the strip into unit or multiple lengths and at mill speeds.

How Strip Is Handled

Disposition of the strip from this point on varies. Strip cut to unit or multiple lengths may be piled flat at annealing temperature or it may be conveyed about 700 feet over a roller table which terminates in a stand of pinch rolls and piler. The piece may be finished as strip and coiled for commercial purposes for the cold mills or for breakdowns for the hand sheet mills.

When finished flat off the hot mill as commercial plate and skelp the steel is transferred from the main runout to a parallel roller table and moved toward the rear of the mill. While in transit the steel passes through a hot roller leveler and is cut to shipping lengths if in the form of skelp, or to specified lengths if in the form of commercial plate. In either case the product is returned to the main runout table over a transfer and conveyed in a reverse direction to piling skids.

Light-gage plates or heavy-gage sheets finished flat from strip are transferred from the main runout to the second runout table and are conveyed toward the end of the mill. While in transit the material passes through a hot roller leveler and when near the terminal end of the runout table is cut by a flying shear to specified lengths. Midway in the main runout table are two machines for coiling the hot strip as it comes from the mill. These are served by a cooling conveyor which delivers coiled stock to the coil storage building. Coiled stock as well as flat material delivered at all piling stations is weighed.

Several finishing units are provided which permit multiple lengths to be side trimmed, coiled, roller leveled and end sheared to specifications. These auxiliary units will handle the hot rolled strip $\frac{5}{8}$-inch and lighter and 72 inches wide.

Complete Cold Mills in June

In the hot finishing department, which parallels the hot strip runout and processing building, is located a normalizing-open annealing furnace which is used to impart the best drawing qualities. Normalized or annealed stock is given one pass through a 2-high cold mill for flatness and then is roller leveled, the latter operating in tandem with the cold mill.

A pickling and scrubbing machine designed to handle the widest iron produced on the hot mill also is provided in the hot finishing department. This unit is served by a stand of cold rolls and a roller leveler built in tandem for imparting a flat set to pickled iron. The department also is equipped with the usual squaring shears, oilers and other auxiliaries.

By June it is expected installation of the cold strip mills and subsidiary equipment will be completed. Hot rolled coils will be delivered to the cold mill through a continuous pickler. The cold finishing end of the mill will include a 3-stand 4-high tandem mill with 76-inch rolls followed by a reel; and two 4-high stands, one with 76-inch rolls served by a reel, and the other with 93-inch rolls. The 93-inch mill is unique in that it is the only one of its type deliberately designed for producing cold rolled sheets in excess of hot strip widths available. This, of course, is accomplished by cross rolling. The cold finishing department also will house a stand of 2-high rolls with 54-inch face equipped with a reel.

The 3-stand tandem mill will handle hot rolled strip in ordinary width and gages in one pass from coil to coil. Further processing of the coils may include an anneal followed by a skin pass on the 76-inch mill, edge trimmed and cut to length. Or coiled stock from the 3-stand 76-inch mill may be roller leveled, sheared to length, annealed, and given a skin pass for temper on the 54-inch 2-high mill. The 93-inch mill is built to temper cold roll single sheets only.

Provision is made for the future installation of an additional 3-stand tandem mill similar to the previously mentioned unit and two additional single stand 4-high mills for temper passing.

Can Anneal Half Output

In the annealing department a sufficient number of conventional type box annealers are available to anneal 50 per cent of the total production. The department also is equipped with radiant tube annealing covers and bases to handle the remainder of the output.

At present a skelp mill is surrounded by the cluster of buildings housing the new strip mill but provision is made for the future abandonment of this skelp mill in which event the entire area of 7 acres will be used for the manufacture of flat rolled products.

One of the problems associated with the construction of the new mill was the establishment of railroad, vehicular and pedestrian traffic routes, and in many cases where the cross-the-mill roads and walkways were cut up the solution was had by underground pedestrian tunnels.

Production of the new broad strip mill merely replaces that of the sheet bar, 30-inch skelp and 84-inch plate mill, which will be abandoned, and the cold rolled sheets made on hand mills. All old-type hand sheet mills at the Campbell plant will be discarded. Only four modern hot mills equipped with continuous pack furnaces for producing light-gage sheets will be retained. In other words, the sum total of rolling equipment abandoned is about equal to the tonnage of the flat rolled steel which the new broad mill has brought in.

Trade Publications

SOLENOID VALVES — Automatic Switch Co., 154 Grand street, New York, in bulletin No. 800 describes its solenoid valves for automatic and remote control of steam, gas, liquids and air.

OIL CONTAMINATION — Acheson Colloids Corp., Port Huron, Mich., has issued bulletin No. 40.1, dealing with crankcase analyses and deductions relative to sludging.

PYROMETER — Pyrometer Instrument Co., 103 Lafayette street, New York, has issued bulletin No. 60, illustrating and describing features of its new surface pyrometer.

Steel Rate Holds, Despite Drop in Sheets, Strip

Pittsburgh, Chicago Up

On Recent Heavy Finished

Orders; Pig Iron Gains

MARKET IN TABLOID

DEMAND *. . . General volume slightly lower.*

PRICES *. . . Firm.*

PRODUCTION *. . . Steel ingot rate unchanged at 46 per cent; full-finished sheets, cold-rolled strip down moderately.*

SHIPMENTS *. . . Finished steel slower; further gain in pig iron.*

GAINS in steelworks operations at Pittsburgh and Chicago, responsive to slightly better demand for heavy finished steel, were offset last week by losses in some other districts due to lighter specifications for sheets and strip, continuing the national average at 46 per cent.

Although automobile assemblies again were increased by 1000 to 111,000 for the week, new commitments were smaller, manufacturers working down inventories. Full-finished sheet production dropped 3 points to 74 per cent; cold-rolled strip 3 to 54.

Steel shipments to Chevrolet's Toledo transmission plant were suspended by a strike, which, however, is not considered serious unless it spreads to other company units. A nearby sheet mill recently operating at capacity for automobile builders has been down for more than a week due to labor difficulties.

May 22 is the date when steelmakers must decide on prices for third quarter, and while some express strong sentiment for an advance, others believe it might prove too great a burden on consumers coming so soon after a general freight rate increase. These also contend that the only result would be to drive in tonnage ahead of the effective date, with a sharp depression in July and August, and little tonnage at the higher levels until fourth quarter.

Structural shape awards in the week increased moderately to 14,052 tons, including 7500 tons of steel piling for piers at the Boston army base. Additional requirements of 30,000 tons of shapes will be up for figures shortly for New York's Triboro bridge and the New York approach to the midtown Hudson river tunnel. Also, in addition to 15,000 tons of reinforcing bars for the Fort Peck, Montana, dam spillway gate structure, now pending, 17,000 tons are to be purchased soon for the spillway. American Oil Co., Baltimore, will build a river transport terminal at Hays, Pa., which will take 3000 to 4000 tons of plates.

A large tonnage of shapes and plates will be required if congress passes the naval construction bill as introduced last week, calling for 24 new ships, and funds for continuing work on 30 others now being built.

New York city board of transportation will open bids May 28 on 500 subway cars, its largest list in several years. Grand Trunk Western is considering purchasing 10,000 tons of rails and is reported to have awarded 150 gondola cars.

Republic Steel Corp. has placed an order for a cold-rolled strip mill at its Warren, O., plant, and American Sheet & Tin Plate Co. has awarded a 72-inch continuous hot and cold strip mill for Gary, Ind.

Reports from foundries in the Middle West indicate their business still is improving, with further gains in pig iron shipments. Sentiment in the scrap market is stronger at Chicago and Pittsburgh, but a reduction of 50 cents a ton at Philadelphia reduces STEEL's scrap composite 8 cents to $9.92. Lake Superior iron ore prices have been reaffirmed for the seventh consecutive year, and lake shipments have started several weeks earlier than in 1934.

Chicago steelworks operations last week were advanced 2 points to 52 per cent; Pittsburgh 1 to 37. Youngstown was off 2 to 56; Cleveland 5 to 57; Buffalo 3 to 34; eastern Pennsylvania ½-point to 29; New England 27 to 25. Detroit held at 82; Wheeling 76; Birmingham 54½.

STEEL's iron and steel price composite is down 1 cent to $32.30, while the finished steel index is unchanged at $54.

COMPOSITE MARKET AVERAGES

	April 27	April 20	April 13	One Month Ago Mar., 1935	Three Months Ago Jan., 1935	One Year Ago Apr., 1934	Five Years Ago Apr., 1930
Iron and Steel	$32.30	$32.31	$32.27	$32.46	$32.58	$32.67	$34.16
Finished Steel	54.00	54.00	54.00	54.00	54.00	53.90	53.66
Steelworks Scrap	9.92	10.00	10.04	10.75	12.03	12.15	14.08

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 27, 1935	Mar., 1935	Jan., 1935	April, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.85c
Steel bars, Chicago	1.85	1.85	1.85	1.90
Steel bars, Philadelphia	2.09	2.09	2.09	2.15¼
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.00½	2.00½	2.00½	2.01¾
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.99¾
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.90
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.50
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	2.05
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.65
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.25
Plain wire, Pittsburgh	2.30	2.30	2.30	2.25
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.50

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.40
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.40
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.80
Wire rods, Pittsburgh	38.00	38.00	38.00	37.20

Pig Iron

	April 27, 1935	Mar., 1935	Jan., 1935	April, 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.56
Basic, Valley	18.00	18.00	18.00	17.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	19.51
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	19.06
No. 2 foundry, Chicago	18.50	18.50	18.50	18.25
Southern No. 2, Birmingham	14.50	14.50	14.50	14.25
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	20.38
Malleable, Valley	18.50	18.50	18.50	18.10
Malleable, Chicago	18.50	18.50	18.50	18.25
Lake Superior charcoal, del. Chi.	24.25	24.04	24.04	23.66
Ferromanganese, del. Pittsburgh	90.13	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.68

Scrap

Heavy melting steel, Pittsburgh	$11.50	$12.40	$13.50	$14.15
Heavy melt. steel, No. 2, east. Pa.	9.25	9.15	9.70	9.50
Heavy melting steel, Chicago	10.00	10.50	12.15	11.75
Rails for rolling, Chicago	11.00	11.65	12.90	12.75
Railroad steel specialties, Chicago	11.25	11.65	13.40	12.75

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.30
Connellsville, foundry, ovens	4.60	4.60	4.60	4.55
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.0926c
Philadelphia, del.	1.98½c
Boston, delivered	2.22c
Buffalo, delivered	2.05145c
Chicago or Gary	1.85c
Cleveland, del.	1.99795c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.20¼c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.99795c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.22c
New York, del.	2.15c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr.....0.45
5100 Cr. spring.....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23½-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.			
Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
*6-in. & over, east fdy.	43.00
*Do., 4-in.	46.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base...$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown.	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
*Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
April 20	9.00	9.12½	7.60	50.62½	49.75	3.70	3.55	4.10	*19.00	14.25	35.00
April 22	9.00	9.12½	7.60	50.75	49.87½	3.75	3.60	4.10	*19.00	14.25	35.00
April 23	9.00	9.12½	7.60	50.80	50.12½	3.75	3.60	4.10	*19.00	14.25	35.00
April 24	9.00	9.12½	7.60	50.87½	50.12½	3.75	3.60	4.10	*19.00	14.25	35.00
April 25	9.00	9.12½	7.60	50.62½	49.87½	3.75	3.60	4.10	*19.00	14.25	35.00
April 26	9.00	9.12½	7.60	50.50	49.50	3.75	3.60	4.10	*19.00	14.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
*Lead, cut, to jobbers	7.50
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Cleveland	5.25- 5.50
Chicago	4.50- 4.75
St. Louis	5.00- 5.25
Heavy Copper and Wire	
*New York	5.87½-6.12½
Chicago, No. 1	5.75- 6.00
Cleveland	5.75- 6.00
St. Louis	5.50- 5.75
Composition Brass Borings	
New York	4.00- 4.25
Light Copper	
New York	4.75- 5.00
Chicago	4.25- 4.50
Cleveland	4.75- 5.00
St. Louis	5.00- 5.12½
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
New York	2.75- 2.87½
Cleveland	2.50- 2.75
Chicago	2.62½-2.87½
St. Louis	2.75- 3.00
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.25- 2.50
Aluminum	
Borings, Cleveland	8.00- 8.25
Mixed, cast, Clev.	11.75-12.25
Mixed, cast, St. L.	12.75-13.00
Clips, soft, Clev.	13.50-13.75

SECONDARY METALS

Brass ingot, 85-5-5-5	8.00
Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.25- 8.50
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	8.00- 8.50
Chicago, No. 1	9.75-10.00
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	9.50-10.00
Eastern Pa., No. 2	9.00
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.00- 7.50
N. Y., deal, No. 2	7.00
N. Y., deal. barge	8.50
Pittsburgh, No. 1	11.25-11.75
Pittsburgh, No. 2	10.00-10.50
St. Louis	7.25- 7.75
Valleys, No. 1	11.00

COMPRESSED SHEETS

Buffalo, dealers	8.00- 8.50
Chicago. factory	8.50- 9.00
Chicago, dealer	7.50- 8.00
Cleveland	8.00- 8.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50
Pittsburgh	10.75-11.25
St. Louis	7.00- 7.25
Valleys	10.00

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.00- 6.50
Pittsburgh	9.75-10.25
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	5.50- 6.00
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	11.00-11.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.00-11.50
Detroit	9.50-10.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	9.75-10.00
Pittsburgh	11.50-12.00
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	5.75- 6.25
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.00
N. Y., deal. fdry	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.00-11.50
Eastern Pa.	13.50
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	11.00-11.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	12.75-13.25

FROGS, SWITCHES

Chicago	9.75-10.00
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	9.75-10.00
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.00-10.50
Chicago, No. 1, net	8.50- 9.00
Chicago. No. 2	9.75-10.00
Cincinnati, No. 2	7.75- 8.25
Eastern Pa.	10.00-10.50
N. Y., No. 1, deal	7.25- 7.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.00- 8.50
Cinci., No. 1, deal	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.00- 6.50
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	10.00

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	1.25- 1.50
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	5.00- 5.50
Detroit	3.50- 4.00
Eastern Pa.	5.50- 6.00
New York, dealers	1.50- 2.00
Pittsburgh	7.75- 8.25
St. Louis	3.00- 3.50
Valleys	7.75- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	8.50- 9.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	10.50-11.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur	9.50-10.00
Cleveland	7.00- 7.50
Eastern Pa.	9.00
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50
New York dealers	12.00-12.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00- 9.00
Boston, iron deal	5.25- 5.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago. rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.25- 9.75

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.25
Buffalo, mach.	10.25-10.75
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago. railr'd net	8.00- 8.50
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-12.00
E. Pa.,mixed yard	8.50- 9.50
Pittsburgh, cupola	11.75-12.25
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	4.75- 5.00
Buffalo, break.	8.00- 8.50
Cleveland, break.	7.50- 8.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00
N. Y., break. deal	5.00- 5.50
Pittsburgh	10.75-11.25

MALLEABLE

Birmingham, R. R.	8.50- 9.50
Boston, consum.	12.00-12.50
Buffalo	12.00-12.50
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	10.00-10.50
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	9.50-10.00
Chicago	10.75-11.25
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.50-12.00
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.52c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.38½c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.52c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.56c
Boston	3.60c-3.85c
Buffalo (h)	3.40c
Chattanooga*	3.91c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.48½c
Los. Ang.(f) (d)	5.70c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.77c-4.27c
Philadelphia	3.58c
Pittsburgh(h)	3.30c
Portland (f)	5.85c
San Fran.(f) (d)	5.80c
Seattle (f) (d)	5.85c
St. Louis	3.59c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.109-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 25

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.16 3 2 6	$13.99	1 14 0
Basic bessemer	15.16 3 2 6*	12.67	1 12 0
Hematite, Phos. .03-.05	14.79 3 1 0	.....	.....
SEMIFINISHED STEEL			
Billets	$26.68 5 10 0	$19.33	2 7 0
Wire rods, No. 5 gage	41.23 8 10 0	37.04	4 10 0
FINISHED STEEL			
Standard rails	$37.59 7 15 0	$45.88	5 10 0
Merchant bars	1.63c 7 10 0	1.17c to 1.22c	3 2 6 to 3 5 0
Structural shapes	1.60c 7 7 6	1.15c	3 1 6
Plates, †¼ in. or 5 mm	1.74c 8 0 0	1.54c	4 2 6
Sheets, black, 24 gage or 0.5 mm	2.01c 9 5 0	2.16c	5 16 0††
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	3.26c	8 15 0
Bands and strips	1.84c 8 10 0	1.49c	4 0 0
Plain wire, base	2.01c 9 5 0	1.99c	5 7 6
Galvanized wire, base	2.44c 11 5 0	2.33c to 2.37c	6 5 6 to 6 7 6
Wire nails, base	2.60c 12 0 0	2.15c	5 15 0
Tin plate, box 108 lbs.	$ 4.34 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.37 3 7 6(a)	$17.16	260	$12.54	370	$25.40 63
Basic bessemer pig iron	16.37 3 7 6(a)*	12.21	185	11.19	330	28.02 (b) 69.50
Furnace coke	4.00 0 16 6	7.92	120	3.73	110	7.66 19
Billets	26.68 5 10 0	28.38	430	14.92	440	38.90 96.50
Standard rails	1.79c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.87c 8 12 0	1.68c	560	.83c	550	2.01c 110
Structural shapes	1.90c 8 15 0	1.65c	550	.83c	550	1.97c 107.50
Plates, †¼-in. or 5 mm	1.97c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.28c 10 10 0§	2.55c	850‡	1.16c	775‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.82c 13 0 0	4.05c	1,350	2.25c	1,500	6.77c 370
Plain wire	2.01c 9 5 0	3.39c	1,130	1.65c	1,100	3.17c 173
Bands and strips	2.03c 9 7 0	1.95c	650	1.05c	700	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 69 per cent over paper sterling.

Bars

Bar Prices, Page 58

Pittsburgh — Declines were reported last week in aggregate bar bookings but shipments were steady. Apparently some contraction in bar demand is traceable to a more cautious buying attitude by automotive interests although miscellaneous bar orders are generally unchanged. There is a continued brisk demand in this district for seamless tubing piercing rounds up to about 3½-inch diameter. Bars at 1.80c are unchanged, as is the alloy grade at 2.45c, base Pittsburgh.

Cleveland—The strike at Chevrolet's transmission plant in Toledo, O., has led to suspension of steel shipments temporarily. About 50,000 transmission sets are available there. From other automobile plants and forge shops bar specifications are in steady volume. Business is well diversified, miscellaneous tonnage being substantially larger than last month.

Chicago—While steel bar demand is slightly less active, changes are relatively small and consumption appears well sustained in most important industries. Requirements of automotive and farm implement industries, the leading outlets for bars, are steady and there is no indication of early recession in needs. Bar mills are more active in production of reinforcing material.

Boston—Most bar finishers are less active, although forging shop requirements are generally unchanged. Consumers of commercial steel, alloy and cold-finished are buying close to current needs and are expected to follow this policy unless prices are advanced for third quarter.

New York—Steel bars are moving slowly in this market, consumers buying only for nearby needs. Prices are unchanged.

Philadelphia — Commercial steel bar business still lags, although there is less pressure from consumers for lower prices, in line with the recent reduction in cold-finished bars. Commercial steel bars are 1.80c, Pittsburgh, or 2.09c, Philadelphia, with no changes yet in the Pennsylvania intrastate freight rates.

Plates

Plate Prices, Page 58

Pittsburgh—The market continues fairly active from the standpoint of prospective river barge work. Last week American Oil Co., Pittsburgh, purchased title to 10½ acres of land at Hays, Pa., on the Monongahela river, where it will build steel tanks, buildings and a steel tank car loading rack, at cost of about $1,000,000 requiring 3000 to 4000 tons of plates for a complete river transportation terminal. A fleet of barges is also expected to be inquired for shortly. Gulf Oil Co., Pittsburgh, is installing storage tanks at Nashville, Tenn., on the Cumberland river, having recently completed the pipe line from the tanks to the river.

Cleveland—Several water tank and pipe line projects in this district are expected to mature in May, requiring a total of 2300 tons of plates and shapes. The largest of these is for a welded line from Elyria, O., to the city's filtration plant on Lake Erie at Lorain. Wheeling & Lake Erie is inquiring for plates for car repairs. While consumers are paying higher delivered prices, due to the interstate freight surcharges this apparently has not interrupted the flow of small orders. The Cleveland plate mill last week operated at 45 per cent.

Chicago — While plate requirements of structural fabricators are increasing slowly, tonnages moving to railroads continue relatively light and both municipal and industrial tank work are quiet. Some improvement in industrial tank construction is anticipated, but small lots generally are involved in new inquiries.

Boston—Plate buying is restricted to small lots for miscellaneous requirements. Shipments against contracts for naval ships building in New England are slightly heavier. Boiler and other fabricating shops have small backlogs as a rule.

New York—Buying of plate tonnage is light. The Texas Co., New York, is expected to place steel shortly for field tanks for a project in Texas but may delay indefinitely work on the main unit. Platemakers have much interest in the naval appropriation bill carrying 24 ships, half probably to be built in private yards. The bill also asks funds to continue work on 30 ships under construction and for building 550 airplanes. A large floating dry dock for the navy is also under consideration.

Philadelphia—Plate business is still spotty, with new prospective work including approximately 300 tons of plates for the lightship NANTUCKET, to be built by Pusey & Jones, Wilmington, Del., and 150 tons of plates for five locomotives by the Baldwin Locomotive Works for the National Railways of Mexico. In addition to the plates, the Pusey & Jones job will require, about 145 tons of shapes and bars. About 100 tons of steel, the major portion of which will be plates, will be required for a tugboat for a local towing company by the Spedden Shipbuilding Co., Baltimore. Some new repair jobs are requiring a fair plate tonnage at the Sun plant in Chester, Pa. Joseph Cattie & Brother, Philadelphia, have been awarded 403 tons of galvanized plates against navy requisition 557, on which bids were opened here March 28. Carnegie Steel Co. recently booked 600 tons of floor plates and stringer beams for resurfacing a bridge in Harrisburg, Pa. The delivered price on plates to Philadelphia remains 1.98½c.

San Francisco—Steel Tank & Pipe Co., Berkeley, Calif., took 310 tons of 24 and 30-inch welded steel pipe for the east bay municipal utility district, Oakland, Calif., and the Western Pipe & Steel Co., San Francisco, booked 245 tons for the Crystal Springs pipe line tunnels for San Francisco. Bids have been opened on close to 1600 tons for a pipe line at Eureka, Calif., and on 153 tons for a 250,000-gallon tank and tower for Torrance, Calif. Bids open May 15 for 550 tons for 21 and 28-inch land pipe for the Fort Peck dam in Montana.

Seattle—Plate demand is confined to small tank and stack jobs, no large projects having developed. Tacoma's water system extension is pending but bids have not been called. The Chicago, Milwaukee, St. Paul & Pacific will build a 150,000-gallon fish oil storage tank here.

Contracts Placed

650 tons, 60-inch pipe and specials, Diamond Alkali Co., Alkali, O., to National Tube Co., Pittsburgh.

403 tons, galvanized plates, navy requisition 557, bids March 28, to Joseph Cattie & Brother, Philadelphia, who are subletting the plain material; 230 tons are for the Philadelphia navy yard, 115 tons for Boston; and 28 tons for Charleston, S. C.

400 tons, approximately, T-Tri-Lock flooring, for resurfacing Market street bridge, Harrisburg, Pa., recently placed with Carnegie Steel Co., Pittsburgh, which also received about 200 tons of stringer beams for the same project.

310 tons, 24 and 30-inch, welded steel pipe, Oakland, Calif., to Steel Tank & Pipe Co., Berkeley, Calif.

245 tons, Crystal Springs pipe line tunnel, San Francisco, to Western Pipe & Steel Co., San Francisco.

165 tons, six tanks, Tide Water Oil Co., Bayonne, N. J., to Buffalo Tank Co., New York.

110 tons, two tanks, Socony-Vacuum Oil Co., Trenton, N. J., to Chicago Bridge & Iron Co., Chicago.

Contracts Pending

3000 to 4000 tons, construction of six to nine river barges, terminal tanks and miscellaneous work, Hays, Pa., for American Oil Co., Baltimore; plans being prepared and inquiry expected within a week to ten days.

1600 tons, 24-inch pipe line, Eureka, Calif.; bids opened.

550 tons, 21 and 28-inch land pipe, Fort Peck dam, Mont.; bids May 15.

300 tons, lightship NANTUCKET, Pusey & Jones, Wilmington, Del., awarded con-

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struction contract; also approximately 135 tons of shapes and 10 tons of bars.

250 tons, 50-inch outlet pipe, Coyote dam spillway, San Jose, Calif.; Macco Construction Co., Clearwater, Calif., low on general contract.

150 tons, for five locomotives for the National Railways of Mexico, by Baldwin Locomotive Works, Eddystone, Pa.

100 tons, plates and other steel products, tug for a Philadelphia towing company, to Spedden Shipbuilding Co., Baltimore.

100 tons, 250,000-gallon standpipe, Sterling, Mass.; bids April 30.

Unstated tonnage, 400 lengths, 21 and 28-inch line pipe fabricated from ¼ and ½-inch plates; bids to Kansas City army engineers, May 15.

Sheets

Sheet Prices, Page 58

Pittsburgh — Reflecting a more cautious buying policy by automotive manufacturers, full-finished sheet orders have diminished in number and total tonnage. Mill operations also reflect this trend and were down 3 points to 74 per cent. Common black sheet production dropped to 66 per cent, and jobbing mills were off 5 points to 42 per cent. Miscellaneous sheet demand is on the uptrend and includes a number of specifications from electric motor makers, road machinery builders and jobber specifications. There has been no change in sheet prices.

Cleveland — Newton Steel Co.'s sheet mill at Monroe, Mich., has been shut down since April 19 by labor difficulties. At Cleveland, sheet mill operations are slightly lower, averaging about 75 per cent for the week. Little change is noted in the volume of specifications from automobile manufacturers and partsmakers. Here the most encouraging feature of the market is the sustained, well diversified character of buying.

Chicago — Sheet demand is slightly less active, though consumption in some industries has held up better than was anticipated a short time ago. Shipments to the automotive industry continue heavy, but new business is lighter. Orders from miscellaneous consumers also are smaller than during the early part of the first quarter, with most users inclined to buy for early needs and to maintain stocks as low as possible.

Boston — Shipping orders from several industrial consumers have declined, while warehouses are operating with light stocks. Galvanized demand has not attained the seasonal increase expected. Household goods continue to lead demand.

New York—Sheet tonnage is sustained fairly well, although the general volume is smaller than a month ago. Requirements of oil burner

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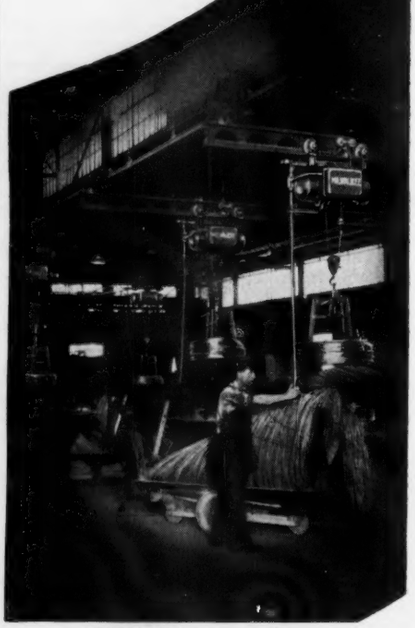


P&H Hoists range from ¼ to 15 tons capacity.

P&H MILWAUKEE ELECTRIC HOISTS

manufacturers are down moderately.

Philadelphia — Fairly good tonnages continue to be placed by autobody makers here, otherwise sheet business appears to be tapering. Early award is expected on 200 to 225 tons of automobile license material for Virginia. With intrastate rates unchanged in Pennsylvania, delivered prices on all grades of sheets here are steady.

Cincinnati — Demand for galvanized sheets is showing a normal trend upward. Otherwise sheet demand is without feature, specifications being fairly steady. Automotive backlogs are small. Mill schedules are about 70 per cent.

St. Louis—A reduction in backlogs is reported by producers and distributors in this district, and demand is somewhat irregular. Requirements for household utilities, radio and some other users are holding up well, but recessions are noted elsewhere.

Birmingham, Ala. — Mills have fairly good schedules and shipments are not far behind production. Agricultural districts have been purchasing steadily.

Transportation

Track Material Prices, Page 59

Board of transportation, New York, will issue an inquiry this week for 500 steel passenger subway cars, bids to close May 28. This is the largest subway order in several years. Specifications will be similar to the last lot, which was placed wtih American Car & Foundry Co., New York.

Chicago, Burlington & Quincy will start construction shortly of 500 steel gondolas at its shops at Galesburg, Ill., steel orders having been placed.

Interstate commerce commission has approved a PWA loan to the Erie and, the money now being available, purchase early in May is expected of the following material: 17,850 tons of rails; 284,397 tie plates, 3000 kegs of spikes; 25,353 joint bars; 186,222 rail anchors and 541 lag screws, totaling 5235 tons.

PWA has anounced an allottment of $380,000 for a loan to the Akron, Canton & Youngstown for purchase of 7394 tons of steel rails and the necessary fastenings.

Grand Trunk Western, of the Canadian National railways, is planning to buy 10,000 tons of rails.

Lehigh Valley is releasing steel for a car repair program at its shops at Sayre, Pa. Repair shops of the New York Central are now operating at about 60 per cent of capacity.

Sixth avenue surface line in New York is planning to substitute buses for street cars.

Car Orders Placed

Grand Trunk Western, 150 steel gondolas, 70-ton capacity, reported placed.

Locomotives Placed

Belt Railway Co. of Chicago, two 600-horsepower diesel switching locomotives, to American Locomotive Co., New York.

Car Orders Pending

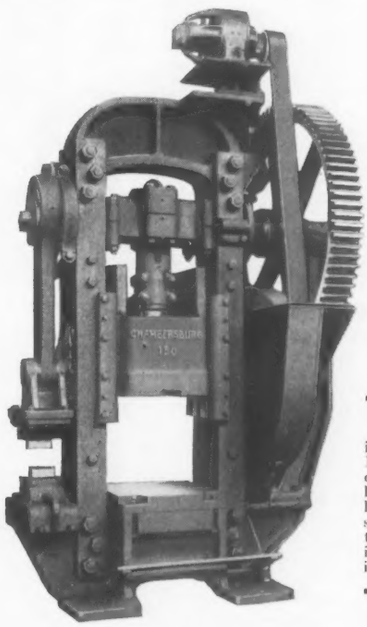
New York Board of Transportation, 500 subway cars for the Eighth avenue line, specifications to be issued May 1, with bids to be closed May 28.

Rail Orders Pending

Erie, 17,850 tons; bids early in May; also 284,397 tie plates, 3000 kegs spikes, 25,353 joint bars, 186,222 rail anchors, 541 lag screws, aggregating 5325 tons.

Buses Placed

American Car & Foundry Motors Co., New York: Six 30-passenger city coaches, for Chicago Surface Lines, Chicago; seven 39-passenger city coaches, for Eastern Massachusetts



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Street Railway, Boston; two 40-passenger city coaches, for Boston Elevated Railway, Boston; one 30-passenger city coach, for Nanticoke & Newport Auto Bus Co., Wanamie, Pa.; one 25-passenger city coach, for Interstate Busses Corp., Springfield, Mass.

Twin Coach Corp., Kent, O.: Eleven 30-passenger city coaches, for Milwaukee Electric Railway & Light Co., Milwaukee; five 30-passenger city coaches, for Reading Coach Co., Reading, Pa.; five 30-passenger city coaches, for Boston Elevated Railway, Boston; six 37-passenger city coaches, for Capital Transit Co., Washington; three 30-passenger city coaches, for Washington Rapid Transit Co., Washington; two 30-passenger city coaches for San Diego Electric Railway Co., San Diego, Calif.; one 30-passenger bus, for United Electric Railway Co., Providence, R. I.; two 34-passenger buses, for Martin V. Van der Wal, Heemstede, Netherlands.

Kenworth Motor Truck Corp., Seattle: Three 25-passenger intercity coaches, for North Coast Transportation Co., Seattle; three 21-passenger intercity coaches, for Washington Motor Coach Co., Seattle; one 21-passenger intercity coach, for Edward Gaffney, Orofino, Idaho.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 59

Some suspensions on bolt and nut orders have been received at Cleveland from automobile manufacturers, due to their labor difficulties. Specifications for the month are moderately ahead of those in March, the automobile industry taking about half the output; jobbers, railroads and stove manufacturers also showing up well.

Specifications against second quarter contracts still are coming in slowly at Chicago and price shading in some instances continues to defer establishment of the 70-10-5 discount on bolts and nuts. Concessions are reported most prevalent in connection with jobber purchases.

At Pittsburgh, buying in April has been less than in March, attributable to heavy specifying before the price change April 1. Since, prices have been fairly steady for bolts and nuts on the basis of 70-10-5 off list. Large rivets hold unchanged at 2.90c, base Pittsburgh or Cleveland, 3.00c, Chicago.

Semifinished

Semifinished Prices, Page 59

A leading user of sheet bars in the Pittsburgh district is temporarily suspending its commitments this week in order to balance inventories. A fairly steady demand continues for tin bars, wire rods and skelp. At Pittsburgh, semifinished steel is quoted on the following basis: $27 for billets, blooms and slabs; $28 on sheet bars, and $38 for wire rods.

Shapes

Structural Shape Prices, Page 58

New York—Additional requirements for the Triboro bridge and New York approach to the midtown Hudson river tunnel will soon place close to 30,000 tons of active structural requirements in the market Except for about 2000 tons for school buildings in the district new inquiry is still sluggish.

Pittsburgh—Inquiries are out for numerous small factory jobs, including 300 tons for a warehouse addition at Pittsburgh for International Furniture Co.; a 300-ton bottle warehouse at Zanesville, O., for Kerns-Gorsuch Co., and 195 tons in relocation of a Ohio Power Co. transmission line near Bolivar, O. Plain structurals hold at 1.80c, Pittsburgh.

Cleveland—Inquiries for small lots of shapes for industrial plant additions are conspicuous in the market. Three received one day last week require a total of 200 tons. The Western Automatic Screw Co., Elyria, O., however, has not yet closed for 400 tons for a new plant. Columbus, O., is inquiring for 800 tons of steel piling and 500 tons of reinforcing bars for a bridge.

Chicago—Structural orders generally are for small individual lots but fairly large tonnages are pending. Most of the latter are for public projects and include 2200 tons for a California bridge, 1600 tons for a dam in that state, 1500 tons for a viaduct at Des Moines, Iowa, and 1300 tons of piling for a Denver water diversion project. Operations of fabricators gradually are increasing, with prospects favorable for further improvement during the balance of the quarter.

Boston—Inquiry for small lots of structural steel is slightly more active, but the total volume on the books of fabricators is light. Public works supply most of the tonnage.

Philadelphia—A local fabricator, the Belmont Iron Works, has booked two additional tonnages, following the receipt of two awards the preceding week, but otherwise structural business has been light. Competition continues severe on fabricated work. Shape prices are unchanged at 1.90c, Bethlehem, or 2.00½c, Philadelphia.

Birmingham, Ala.—Award of several small tonnages are noted, including two house boats for conservation agencies in Arkansas, and a government oil barge for the Charleston, S. C., district, to be produced by Ingalls Iron Works Co., here.

San Francisco—Demand for structural shapes continues quiet, and awards aggregated less than 1500 tons. Bids have been received on 1296 tons of sheet steel piling for the Cheery creek retarding dam, Sullivan, Colo. Few new inquiries are noted.

Seattle — The week's largest project was the 711-foot steel and concrete railroad subway at Nampa, Idaho, on which J. J. Burke Co., Salt Lake City, Utah, was low bidder at $186,564. Considerable steel will be required. Surveys are being made for a $300,000 span at Puget island, Columbia river. Snohomish county, Washington, has plans for two grade crossings to cost $150,000.

Shape Awards Compared

	Tons
Week ended April 27	**14,052**
Week ended April 20	**12,460**
Week ended April 13	**27,997**
This week in 1934	**11,886**
Weekly average, 1934	**16,284**
Weekly average, 1935	**15,514**
Weekly average, March	**20,670**
Total to date, 1934	**291,328**
Total to date, 1935	**263,748**

Shape Contracts Placed

7500 tons, mainly piling, repairs, substructure, army base pier, Boston, to Kalman Steel Corp., Bethlehem, Pa.; T. Stuart & Son Co.,, Watertown, Mass., general contractor.

825 tons, Bernheim Distilling Co. Inc., whiskey warehouse, Louisville, Ky., to International Steel & Iron Co., Evansville, Ind.

660 tons, state highway bridge, Franklinton, La., to Jones & Laughlin Steel Corp., Pittsburgh.

475 tons, state bridge, Ocmulgee river, Douglas-McRae highway, Coffee-Telfair counties, Georgia, to McClintic-Marshall Corp., Bethlehem, Pa.; W. E. Scott & Co., Thomasville, Ga., general contractor.

400 tons, bridge, Posey, Ill., to Worden-Allen Co., Milwaukee.

380 tons, Brown-Forman Distillery Co., whiskey warehouse, Louisville, Ky., to International Steel & Iron Co., Evansville, Ind.

375 tons, J. H. Heald Corp., plant additions, Lynchburg, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

375 tons, towers, Dubuque, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

300 tons, alterations to Adam Store Co. building, Buffalo, to McClintic-Marshall Corp., Bethlehem, Pa.

270 tons, department store, Leverson & Kline, Baltimore, reported placed with an unnamed fabricator.

250 tons, sanitarium, Utica, N. Y., to Belmont Iron Works, Eddystone, Pa.

230 tons, hospital building, New York, to Berkshire Iron Works, Brooklyn, N. Y.

225 tons, building, International Harvester Co., Chicago, to Worden-Allen Co., Milwaukee.

200 tons, bridge, Howard county, Texas, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

200 tons, bridge, Chippewa county, Wisconsin, to Fort Pitt Bridge Works, Pittsburgh.

200 tons, building, In-Tag Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

175 tons, highway bridge project NRM-403-E, Georgia, to Virginia Bridge & Iron Co., Roanoke, Va.

172 tons, plant for American Forge Co., Berkeley, Calif., to Moore Drydock Co., Oakland, Calif.

165 tons, box factory, Kieckefer Container Co., Delair, N. J., through the Ballinger Co., Philadelphia, to the McClintic-Marshall Corp., Bethlehem, Pa.

165 tons, Scott school, Carnegie, Pa., to Levinson Steel Co., Pittsburgh.

160 tons, shapes and bars, state bridge, Proquonock river, Trumbull, Conn., to McClintic-Marshall Corp., and Kalman Steel Corp., Bethlehem, Pa.; Mariani Construction Co., New Haven, Conn., general contractors.

130 tons, garage, Chicopee, Mass., to Haarmann Steel Co., Holyoke, Mass.

120 tons, subway, for Southern Pacific Co., Delano, Calif., to Columbia Steel Co., San Francisco.

100 tons, school, Peekskill, N. Y., to Belmont Iron Works, Eddystone, Pa.

Shape Contracts Pending

8000 tons, Harlem river lift span crossing, Triboro bridge, New York; bids May 16.

2800 tons, crossing of Southern Pacific & Key System tracks, Oakland, Calif., for San Francisco-Oakland bay bridge; bids opened.

1800 tons, sewage disposal plant, Waukegan, Ill.; bids May 3.

1600 tons, high school, New Dorp, Staten Island, N. Y.; bids May 16, to department of education, New York.

1500 tons, viaduct, Des Moines, Iowa.

1296 tons, sheet piling, retarding dam, Cherry Creek, Colo., for Denver; bids opened.

800 tons, Main street bridge, Columbus, O.; bids May 9. Project also takes 500 tons of reinforcing bars.

800 tons, viaduct, Ft. Dodge, Iowa.

550 tons, state highway bridge, Catskill, N. Y.

300 tons, warehouse addition for International Furniture Co., Pittsburgh.

300 tons, warehouse, Kearns-Gorscuch Co., Zanesville, O.

300 tons, packing plant, Armour & Co., Chicago; bids May 6.

195 tons, 23 towers for relocation of Philo-Canton transmission line for the Ohio Power Co., near Bolivar, O.; bids will be opened by army engineers, Zanesville, O., shortly.

175 tons, factory addition, East Walpole, Mass.

130 tons, state undercrossing, Pierce county, Washington; bids May 7.

100 tons, revolving cranes, specification 617, Boulder dam, Boulder City, Nev.; Judson-Pacific Co., San Francisco, low bidder.

Unstated, state undercrossing, Nampa, Idaho; J. J. Burke Co., Salt Lake City, Utah, low for general contract.

Reinforcing

Reinforcing Bar Prices, Page 59

New York—Awards are not large with lettings confined to several hundred tons, including a grade crossing at Utica, N. Y. Road needs are slightly heavier. Several projects being planned, including more highways and bridges, indicate a heavier inquiry will develop within the next few weeks.

Pittsburgh—Plans of the American Oil Co. to construct a large river transportation terminal at Hays, Pa., on the Monongahela river will require a large but unstated tonnage of reinforcing steel. Inquiry is expected shortly. A contract is about to be awarded by Spillway Builders Inc., New York Life building, Kansas City, on the 17,000 tons of new billet steel reinforcing bars for the Fort Peck, Mont., dam spillway. This project is an addition to about 15,000 tons of bars for the spillway gate structure and cut-off structure on which Addison Miller Inc. & Fielding & Shepley Inc., St. Paul, are low general contractors, and for which no steel contracts have as yet been placed. The market holds at 2.05c, Pittsburgh, for carload lots of new billet bars in cut lengths.

Cleveland—The market is quiet, with few public works projects up for figures. Bids have been postponed

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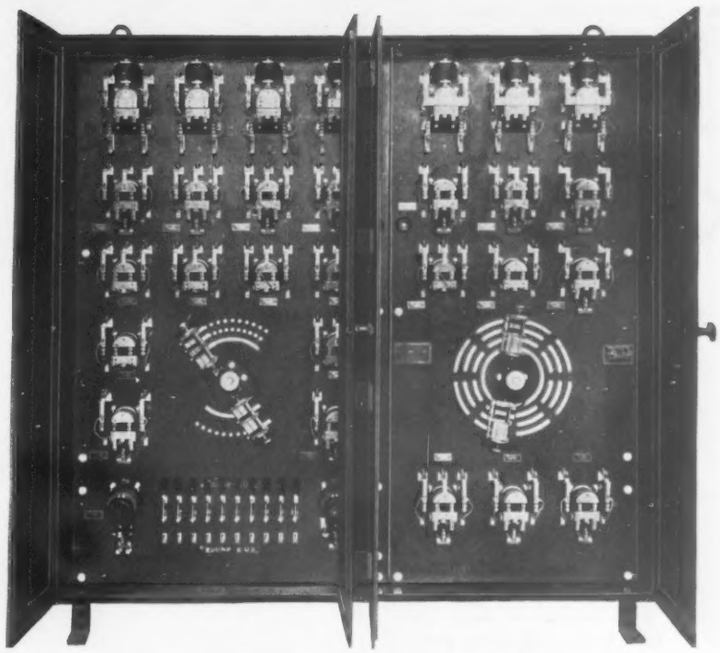

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until May 1 on the Central avenue federal housing project here, requiring 1000 tons of reinforcing bars and 295 tons of steel lintels. Columbus, O. is taking bids May 9 on a Main street bridge, for which 500 tons of reinforcing bars will be purchased.

Chicago—Reinforcing bar orders and inquiries are lighter following the placing of heavy tonnages the past several weeks. Bids are being taken on a meat packing plant here involving 400 tons, while 300 tons have been placed for a Peoria, Ill., distillery. Other inquries include 600 tons for a sewage disposal plant at Waukegan, Ill., and 450 tons for a water diversion project at Denver. Bar shipments for highway work are increasing with additional business in prospect in Illinois and Indiana.

Philadelphia — General contracts have been let on sewage work in the District of Columbia, which will require approximately 1320 tons of reinforcing bars. Apart from this tonnage local sellers are figuring only small lots. Billet steel bars, cut lengths, continue 2.05c, Pittsburgh, or 2.34c, Philadelphia, with no change yet in the intrastate freight rates.

Boston — Substantial inquiry for reinforcing steel bars is lacking, highway and bridge requirements being below normal for this time of the year. Requirements for the Quibban dam project, Enfield, Mass., lead pending projects, bids closing May 7.

Seattle—Increased building construction is noted in Montana where contracts have been awarded for several large schools and public buildings, requiring considerable steel. Locally, new projects are developing slowly and only unimportant jobs are up for figures.

San Francisco — Awards were limited to relatively small lots and did not exceed 800 tons in the aggregate. For the first time this year bookings fell below the total for the corresponding period in 1934. To date 39,100 tons have been placed as compared with 40,715 tons for the corresponding period a year ago.

Concrete Awards Compared

	Tons
Week ended April 27	**1,712**
Week ended April 20	**20,495**
Week ended April 13	**3,346**
This week in 1934	**5,589**
Weekly average, 1934	**4,084**
Weekly average, 1935	**5,476**
Weekly average, March	**5,506**
Total to date, 1934	**86,601**
Total to date, 1935	**93,091**

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Reinforcing Steel Awards

485 tons, Maricopa county municipal water conservation district, Phoenix, Ariz., to unnamed interest.

300 tons, building, Hiram Walker & Sons Inc., Peoria, Ill., to Joseph T. Ryerson & Son, Chicago.

300 tons, buildings, Bronx terminal market, New York, to Joseph T. Ryerson & Son Inc., New York; through Turner Construction Co.

212 tons, state bridge, Ocmulgee river, Douglas-McRae highway, Coffee-Telfair counties, Georgia, to Kilby Car & Foundry Co., Anniston, Ala.; W. E. Scott & Co., Thomasville, Ga., general contractor.

190 tons, grade crossing, New York Central railroad, Utica, N. Y., to Joseph T. Ryerson & Son Inc., Jersey City, N. J.; Bates & Rogers Construction Co., contractors.

125 tons, buildings, United States Industrial Alcohol Co., Newark, N. J., to Concrete Steel Co., New York.

100 tons, repairs, substructure, army base, Boston, to Kalman Steel Corp., Bethlehem, Pa., T. Stuart & Son Co., Watertown, Mass., general contractor.

Reinforcing Steel Pending

3033 tons, crossing of Southern Pacific & Key System tracks, Oakland for San Francisco-Oakland bay bridge; Barrett & Hilp, San Francisco, low on general contract.

1320 tons, sewage development work, District of Columbia, general contracts placed with the Arundel Corp., Baltimore, the Suburban Engineering Co., New York; and the J. W. Kopper Co., Buffalo.

1000 tons, government housing project, Cleveland; bids postponed from April 23 to May 1. Project also takes 295 tons of steel lintels.

600 tons, sewage disposal plant, Waukegan, Ill.; bids May 3.

415 tons, Cheery creek retarding dam, Sullivan, Colo., for Denver; bids opened.

400 tons, packing plant, Armour & Co., Chicago; bids May 6.

310 tons, wharf extension, Fourteenth street, Oakland, Calif.; A. W. Kitchen & Co., San Francisco, low on general contract.

190 tons, bulkheads, pier No. 44 and 46, San Francisco; bids rejected.

Pipe

Pipe Prices, Page 59

Pittsburgh — Steady demand for tubular products continues to hold the average of operations for this industry at 35 to 40 per cent. Current awards comprise chiefly oil country goods, mechanical tubing and boiler tubes. All pipe discounts are unchanged.

Chicago — Activity in cast pipe gradually is improving, aided by an increase in orders of one and two carloads. An encouraging feature of recent buying is a pickup in orders from industrial plants. Fox

Point, Wis., is taking bids on 765 tons of 16-inch. Orders for 1000 tons for the Stickney, Ill., sewage disposal plant are expected to be placed within the next three to four weeks.

Boston—Cast pipe is more active, led by the award of close to 1100 tons for East Smithfield, R. I. Inquiry is heavier and bids are in on several thousand tons, including 1430 tons, with fittings, for metropolitan district commission, Boston.

New York—Cast iron pipe has been advanced $1 a ton, eastern foundry, but in view of erratic prices on some projects recently placed this, in the opinion of some buyers, means little as former prices were frequently shaded. Cast pipe inquiry, showing some improvement for miscellaneous needs, continues below seasonally normal.

Birmingham, Ala. — Recent advance of $1 per ton in base price of cast iron pressure pipe will not affect the market, it is thought. PWA works programs in sight for next 30 to 60 days will bring about demands for pipe calling for some increase in production.

San Francisco — The cast pipe market is quiet. Bookings so far this year have aggregated 7814 tons, compared with 3340 tons for the same period in 1934. San Francisco will take bids May 3 for 345 tons of cast pipe fittings for the water department.

Seattle — Cast pipe sellers are marking time until municipalities obtain fund allocations to finance needed improvements. For economy, some cities are giving preference to steel and wood pipe. Heppner, Oreg., is taking bids May 6 for 3 miles of 8-inch wrapped steel or precalked joint cast pipe.

Cast Pipe Placed

1440 tons, 20-inch cement lined, with fittings, metropolitan water district, Boston, evenly divided between United States Pipe & Foundry Co., Burlington, N. J., and Donaldson Iron Works, Emaus, Pa.

1100 tons, 6 and 8-inch, East Smithfield, R. I., to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Placed

650 tons, 60-inch, Diamond Alkali Co., Alkali, O., to National Tube Co., Pittsburgh.

Cast Pipe Pending

520 tons, 6 and 8-inch, Wolfboro, N. H.; bids in.

262 tons, Pauguitch, Utah, 2 to 8-inch; bids in.

765 tons, 16-inch, Fox Point, Wis.; bids May 9.

Steel Pipe Pending

435 tons, 2 to 8-inch, Pauguitch, Utah; bids in.

Strip Steel

Strip Prices, Page 59

Pittsburgh—Hot-rolled strip steel operations continued unchanged last week at 48 per cent, but cold-rolled strip steel underwent a 3-point decline to 54 per cent. A Pittsburgh district strip producer has begun operations for the first time on a new 12-inch hot mill designed chiefly for production of rim stock. The Pittsburgh base price on hot-rolled strip continues to be 1.85c, and cold-rolled strip steel, 2.60c.

Cleveland—Until there is a decided change in automobile assemblies specifications for steel strip are expected to continue in good volume. Last week Chevrolet notified some of its suppliers to suspend shipments, due to labor difficulties. Other automotive releases showed little change, some General Motors subsidiaries placing additional tonnage.

Chicago—Cold-rolled strip demand is less active, a moderate recession

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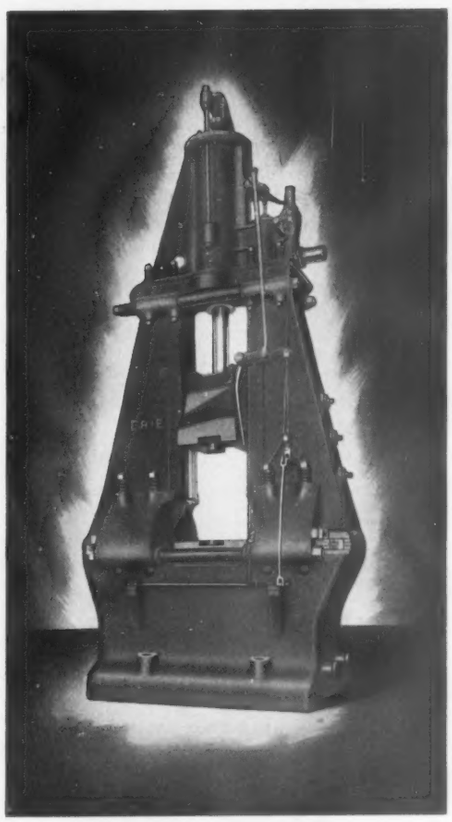

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being noted in business from the automotive industry and miscellaneous consumers. Strip consumption among large users continues to suffer from competition from wide sheets. Activity in hot-rolled strip is fairly steady, though off moderately from the rate of several weeks ago.

Boston—Because of well-spread demand and broader use in some industrial fields, notably builders' hardware and some types of metal furniture, cold-rolled strip activity is steady, although mill backlogs are not large and shipments are somewhat heavier than incoming business. Hot strip is spotty. Prices are firm and unchanged.

Philadelphia—The narrow strip market is listless, and with Pennsylvania intrastate rates unchanged, delivered prices on hot and cold-rolled material have not been raised.

Wire

Wire Prices, Page 59

Pittsburgh—Manufacturing wire specifications appeared fewer and smaller last week, although a heavy demand for fencing and other rural items continues to maintain the wire market to its best level for the year. Pittsburgh base prices of $2.60 per keg on nails, and 2.30c on 6-9 gage plain wire hold unchanged.

Cleveland—Releases from nut and bolt manufacturers are slower, due to smaller specifications from automobile manufacturers owing to labor difficulties. Demand for farm fencing continues strong.

Chicago—While wire demand is slightly less active, shipments continue around recent levels and business still makes a favorable showing with that of recent weeks. Activity in manufacturers' wire is well maintained among most important consumers, but the market for merchant products remains spotty. Fall dating terms on fencing will be announced soon and this is expected to provide some stimulus to demand.

Boston—Manufacturers' wire is steady with operations in most finishing departments holding. Specialties continue to make up a good part of the business. The heavier products have been inclined to lag, except for automobile requirements.

New Wire and Stainless Steel Classes Are Priced

New York—Prices have become effective on a new classification of hot-rolled stainless steel bars at Pittsburgh, and on four new classifications of wire at Worcester, Mass. The new bar classification is described as automobile pump shaft steel, with an analysis of 0.12 per cent maximum carbon, 8 to 15 per cent chrome, 0.08 to 0.15 per cent phosphorus, 0.08 to 0.15 per cent sulphur and 0.20 maximum molybdenum. The price is 17c, Pittsburgh, effective April 18.

The new wire classifications comprise bookbinder wire, high carbon, flat tinned, quotable at $18.70 per 100 pounds, Worcester, Mass.; bookbinder wire, high carbon, round tinned, $13.70; hose reinforcement wire in sizes 0.010 to 0.015 inches inclusive, bright, coppered or liquor-finish, having maximum tensile strength of 238,800 pounds per square inch, $19; and single core wire, in sizes 0.010 to 0.013 inches inclusive, liquor-finish, having maximum tensile strength of 250,000 pounds per square inch, $17.

Prices on the latter two classifications of wire became effective April 20 at Worcester, Mass., and on the former two April 18. On the bookbinder items maximum deduction is allowable to jobbers from base prices of flat or round high-carbon bookbinder wire now filed, not to exceed 7½ per cent.

Cold Finished

Cold Finished Prices, Page 59

Pittsburgh—Cold-finished steel bar orders appear to be increasing in number, but aggregate tonnage is comparable only with the showing a month ago. In turn, cold-drawn bar producers are now operating on smaller backlogs of a month ago so that the outlook for May is uncertain. However, automotive cold-drawn bar buyers are working on considerably smaller parts inventories. Cold-drawn bars remain steady and unchanged on the basis of 1.95c, Pittsburgh, with full observance of other basing points. The cold-drawn alloy bar market remains 2.95c, Pittsburgh.

Tin Plate

Tin Plate Prices, Page 58

Pittsburgh—Canmakers' requirements for tin plate appear to be in steady volume, and tin plate production continues at 85 per cent. Markets of $5.25 per base box for standard tin plate, 2.75c for No. 28 tin mill black sheets, and 3.40c on No. 24 unassorted long ternes are steady.

Ferroalloys

Ferroalloy Prices, Page 60

Pittsburgh—A large producer of ferromanganese in the Pittsburgh district has been inquiring for a substantial tonnage of manganese ore. This buyer only recently began to produce its own requirements. Consumers stocked up on ferromanganese to avoid the freight rate surcharge. In ferromanganese, for example, the freight increase is from $4.79 to $5.1253, making the new Pittsburgh delivered price, $90.1253. Freight rate surcharges on alloys

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are 7 per cent on straight-line hauls, with a limit of 5 cents per 100 pounds.

New York—Shipments of ferromanganese in April appear to be fully as large as for March. The base price continues unchanged at $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is $26, Palmerton, Pa., on lots up to 50 tons, and $24 on 50 tons and over.

Pig Iron

Pig Iron Prices, Page 60

Pittsburgh—With Davison Coke & Iron Co. preparing to produce low phosphorus pig iron at its Neville Island, Pa., stack, it is likely a basing point may be established there. At present, all such iron consumed in the Pittsburgh and nearby districts is based at Steelton, Pa., $23.50 per ton. The Struthers Iron & Steel Co.'s Anna furnace, Struthers, O., resumes blast next month on basic and foundry grades. Announcement of a proposed $2 a to advance on charcoal iron caused some stocking here last week. Charcoal pig iron delivered in Pittsburgh is generally figured on a Lyle, Tenn., base, currently $21.50 a ton plus a $6.12 freight rate.

Cleveland—Pig iron shipments are leveling off, little gain being noted in the past week, and specifications received in smaller volume. The month as a whole, however, will show about 5 per cent increase over March. New orders also have tapered, several thousand tons being booked here during the week, in small lots. The Ford Motor Co. is understood to have closed for 10,000 tons of foundry iron.

Chicago—Activity in pig iron is bearing out the prediction of a month ago of a continued rise in shipments. Deliveries so far this month are 15 to 20 per cent heavier than during the corresponding March period, while new business is keeping pace with that of a month ago. Shipments were affected only moderately by the movement in anticipation of higher freight rates. Automotive and farm implement business still accounts for a large share of the foundry melt. An increase in pig iron prices for third quarter is being considered as a result of the recent advance in freight rates.

Boston—Pig iron buying continues listless and confined to small lots. Foundry melt has improved but little and small consumers are buying only as needed. Uncertainty as to continuance of the steel code is an unsettling factor.

New York—Pig iron tonnage shows little variation from a week ago, although earlier in the month volume was increased slightly in anticipation of the increase in freight rates which became effective April 18. Little change one way or the other is anticipated over the next two or three weeks. There is some talk of increase in third quarter prices, due to the effects of increased freight rates on production costs.

Philadelphia—Shipments for the month now closing will be about on a parity with last month, according to some leading sellers. There appears to be little change in the general melt, and while prospects of higher freight rates brought in some tonnage sooner than otherwise, it has not been large in the aggregate.

Buffalo—Heavy shipments of pig iron before the freight rate advance have cut into current demand as many consumers are well stocked. Shipments from furnaces now are largely for storage.

Birmingham, Ala. — Shipments continue steady. No intimation is given as to increase in base price for third quarter. Demand promises to be active in May with numerous PWA and other federal-aided projects to be started.

Cincinnati—Shipments of pig iron remain steady, close to peak levels for the year. A slight recession equalized a bulge in outside-Ohio orders anticipating new freight schedules. So far this quarter buying has been in small lots but continued talk of higher prices to offset increased costs on account of the freight rate rise may develop a rush to cover at present prices.

Toronto, Ont.—Demand for pig iron continues mostly in single car orders. Melters state the future is too uncertain to justify long term contracts. Foundries now are on an operating schedule of slightly better than 40 per cent, with the daily melt correspondingly improved.

Metallurgical Coke

Coke Prices, Page 59

The beehive coke market is slow, mainly affected by by-product competition, prices on which have become so low that in some sections beehive coke operators will not even attempt to compete. The Connellsville, Pa., oven basis on foundry coke is fairly steady at $4.60 per ton for common brands, and $5.10 per ton for premium grades. However, standard furnace coke at $3.60 per ton, Connellsville ovens, is subject to shading.

Deliveries of foundry coke at Chicago are off slightly, in spite of steady consumption. Impending freight ad-

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vances have caused some anticipation in shipments. Prices are steady. Cincinnati demand is steady and shippers outside Ohio are absorbing the freight increase. Birmingham, Ala., production and shipments are steady at unchanged prices.

St. Louis—All indications point to April being the heaviest month so far this year in the matter of pig iron shipments to melters in this district. A fair volume of new ordering, mainly in small quantities, is reported. Because of the arbitrary bridge rate there has been no change in switching charges in the St. Louis area.

Scrap

Scrap Prices, Page 61

Pittsburgh — No sooner had a district mill last week purchased No. 1 heavy melting steel for $11.25 per ton than brokers began to appraise the market in a different light and raised their buying prices to $11.50, and in some cases, $11.75, all being of the opinion that further and more pronounced mill buying of scrap is immediately impending. For the time being No. 1 heavy melting steel ranges unchanged here at $11.25 to $11.75. Machine shop turnings at $7.75 to $8.25 are nominal in view of application of higher freight rates on long hauls. Specialty scrap remains strong here with a scarcity of available supplies.

Cleveland—Buying is in small volume and shipments are not heavy. A melter recently bought two small lots of No. 1 heavy melting steel at $10 but could obtain no more at that price. Prices are unchanged, but largely nominal.

Chicago—Scrap has a stronger tone, aided by necessity of sellers to bid higher prices in covering orders. While last sales of No. 1 heavy melting steel brought $10, brokers in some instances are paying as high as $10.25 to apply on previous bookings. New mill purchases are absent and consumers' quotations generally are unchanged.

Boston—While dealers are paying up to 50 cents a ton more for heavy melting steel for boat loading, most grades show no additional strength. At dock, dealers are paying $8.50 and $7.50 for heavy melting steel grades and some textile scrap has brought $7.50 to $8, dock, for export. Cast for nearby delivery and for shipment to Pennsylvania is off 25 cents a ton and some shippers are apparently absorbing part of the surcharges on freight. Turnings are still lower. The Worcester, Mass., consumer is not meeting export prices and is therefore taking practically no scrap from around Boston.

New York—Dealers are paying unchanged prices for heavy melting steel for export, but are buying more heavily against expectations of some improvement in foreign demand. Domestic demand is light, but with a slight gain in cast grades. Prices are steadier.

Philadelphia—Steel scrap is nominally easier, with No. 1 at $9.50 to $10, delivered, and No. 2 at $9. Export prices also are easier, with No. 1 now quotable at $9.50, wharf, and No. 2, $8.50. Heavy breakable cast, for domestic account, is easier at $10, delivered. The market generally is still profoundly dull.

Buffalo — Principal melters here have increased their offer and will now pay $10 a ton for No. 1 heavy melting steel and $8.50 for No. 2, they have indicated. These prices are up 50 cents from the quotations in effect during most of April. Dealers now are inclined to hold for further advances and the market continues nominal.

Detroit—Iron and steel scrap prices still continue pegged. Automobile production continues heavy and a large tonnage of scrap is being offered. Ford still is throwing down bundles, but may discontinue this shortly. The movement of scrap out of Detroit by water still lags.

Cincinnati — Yard stocks of iron and steel scrap are being closely held by dealers, bringing a steadier tone during absence of mill buying. Pressure for lower prices is proving a barrier to tonnage deals.

St. Louis—Reports of firming tendencies in Chicago and other points east has had no appreciable effect on iron and steel scrap here, the market continuing quiet and weak. Purchasing consists of small lots of special material, the only exception being the acquisition of 4000 to 5000 tons of heavy melting steel by an east side mill for delivery over the next 60 days.

Birmingham, Ala. — Lagging is still reported in iron and steel scrap with further readjustments in two or three grades. No scarcity is anticipated in this section. Heavy melting steel is quoted at $8.50 per ton.

Seattle—Conditions in the scrap market are unchanged. Despite lack of new business from Japan, exporting houses are holding firm at present levels. Country suppliers are holding firm for higher prices.

Toronto, Ont.—Trading in iron and steel scrap is improving. Shipments of heavy melting steel to the Hamilton district are larger and it is expected the Burlington Steel Co., Hamilton, Ont., soon will be in the market for substantial tonnages for its new electric furnace. Montreal dealers also report better demand for heavy melting steel. Prices are firm and unchanged.

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Iron Ore

Iron Ore Prices, Page 61

Cleveland — Vessel shipments of Lake Superior iron ore have started several weeks earlier than last year. No cargoes were moved in April, 1934, while the movement this

month may reach 200,000 tons. A number of cargoes have left Escanaba, Marquette and Superior, the first cargo being hauled for the Cleveland, Cliffs Iron Co.

The Ford Motor Co. last week had not closed on its inquiry for 180,000 tons. Figures had to be submitted April 24, but the company indicated that it might take a little while to decide. On April 23 one of the leading producers announced it had closed with an affiliate at last year's prices, the same which have been in effect for the past six years, namely: Old range nonbessemer and Mesabi bessemer $4.65; old range bessemer $4.80, and Mesabi nonbessemer $4.50, delivered lower lake docks. These are the base prices now applying on the term contracts which producers have with their associated interests. Producers absorb the 11.2 cents per gross ton freight surcharge. The Ford company's inquiry is the only one of importance in the open market.

Warehouse

Warehouse Prices, Page 62

Pittsburgh — On the relatively small and infrequent tonnages which Pittsburgh jobbers move in interstate shipments they will absorb freight rate surcharges. As formerly, 10 cents per 100 pounds, or $2 a ton, continues to be the allowable deduction from Pittsburgh base jobbing prices, which are unchanged. Demand continues to improve.

Cleveland — Tonnage booked by leading warehouses here is slightly smaller this month than in the comparable period in March. During the last few days there has been some improvement in demand for certain products. Jobbers' orders for nuts and bolts for the month are a close second to those from automobile manufacturers.

Chicago—Sales continue steady and there are expectations of a small gain in orders compared with March. Building construction gradually is accounting for larger steel tonnages.

Philadelphia—Leading iron and steel jobbers here report April tonnage about on a parity with March, and some jobbers specializing in sheets assert there will be an actual increase. One of the latter interests estimates that his bookings this month will exceed March by about 20 per cent.

Cincinnati—Warehouse sales are holding close to March levels. Prices are unchanged.

St. Louis—Business of iron and steel warehouses holds steady, with two leading interests reporting slight betterment this week. Present indications point to an April volume about on a parity with March.

Seattle—Volume is showing a tendency to slacken but the month is well in advance of March although not up to the level of April, 1934. Miscellaneous items out of stock are moving freely.

Steel in Europe

Foreign Steel Prices, Page 62

London — (*By Cable*)—Considerable concern is felt on the Continent over failure of the recent negotiations looking to Great Britain's entry into the steel cartel. Failure was due to the wide gap between the tonnage Great Britain was willing to accept under the previous tariff and Continental requirements. Another meeting will be held in London, April 30.

British steel and iron trade is quieter, owing to the Easter interruption. Furnaces and steelworks generally are well occupied and the trade hopes for increasing activity.

Continental export business is fairly active, especially to Egypt and China. Belgium is readjusting home prices to the new value of the belga.

Nonferrous Metals

Nonferrous Metal Prices, Page 60

New York—Continued sharp advance in silver prices held the attention of all nonferrous interests last week. It is believed that if the rise continues much further production of other metals may be increased in order to obtain the value of the by-product silver output. Lead was boosted $1 a ton Monday and held firm at that level throughout the week.

Copper—Sales were lighter with total allocated during April through Thursday 24,094, or at a slightly higher rate than in March. Fabricators are still fairly active in the market. Blue eagle price continued firm at 9.00c, Connecticut, while the export price was easier in the range of 7.60c to 7.75c, c.i.f.

Lead—Demand continued active and producers advanced the price to 3.60c, East St. Louis. Although lead statistics for March showed an increase of 3592 tons in refined stocks, this gain was immediately discounted in view of steadiness in total lead

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stocks and in continued heavy shipments.

Zinc—Prime western prices held steady at 4.10c, East St. Louis although demand was light. Slab zinc sales ended April 20 amounted to about 2650 tons, a moderate showing in view of heavy sales during the previous week.

Tin—Trading on most days was slow but prices moved up to around 50.50c for Straits spot. A bill was introduced in the house of representatives which would encourage the domestic production of tin and promote the discovery and use of substitutes.

Antimony—Market was dull and prices easy due to reported weakness in the China market. Chinese spot, however, was quotably unchanged at 14.25c.

Aluminum—Both virgin and remelt grades held unchanged in generally slow markets.

Quicksilver

New York—Quicksilver prices are steady, and demand slow. Round lots of 100 virgin flasks of 76 pounds each remain unchanged at $72.50 a flask, lots of 15 to 24 flasks, inclusive, $74, and single flasks $75.

NRA Extension Bill Hits Price Cutting

(*Concluded from Page* 11)

ized by the steel code and which the steel industry desires to continue.

"The device of open-price filing," the board's policy announcement reads, "should be perfected, guarded against abuse and applied with discrimination to the industries to which it is appropriate. In certan industries and for certain commodities for which an organized open market is not practical, the virtues of an organized commodity exchange may be approximated through the device of open price filing."

The burden of proof that open-price filing should be introduced in codes where it is not now sanctioned rests with the applicant industry, the board has ruled.

The board's statement also says:

"Industry is the instrument through which goods or services are supplied. The producer, the laborer, and the consumer alike have a stake in its efficient and orderly operation. The facilitating of adjustments among these several interests and their individual members is the function of price. Price also facilitates adjustments among the many industries whose products compete with one another for the consumer's dollar. Unless price operates effectively to determine these working arrangements among the interested parties, some deliberate arrangement or planned control must be permitted or established."

Citing differences between industries, the board points out that "identical treatment" cannot be accorded all. "But whatever the necessity for variation in detail, the general objectives of price policy are definite. It must promote fairness between the parties to an industry and make its contribution to the betterment of the standard of living. A control of production is inevitable under any industrial system. A long experience has led us to leave that problem to the open market. * * * The strategy of policy must find expression in a multitude of decisions. But its end is single—an economy, not of scarcity but of plenty."

"Means should be flexible," the introduction concludes, "requiring the use of a miscellany of devices and procedures. Objectives should be stable. The goal sought is the establishment of conditions under which in a free and open market competition may determine a fair price."

Other NRA News

BUDGETS PROPOSED

Rolling steel door industry, $4450 for calendar year 1935; steel plate fabricating industry, $59,050 for year beginning May 1.

PRICE FILING IS STAYED

National industrial recovery board has approved application of the cut tack, wire tack and small staple industry to stay price-filing provisions of its code until June 16, present expiration date of NRA.

MADE SCRAP CODE AUTHORITY

These five men, nominated by the Institute of Scrap Iron & Steel, New York, have been approved as the scrap iron and steel trade code authority until April 13, 1936:

Darwin Luntz, Luntz Iron & Steel Co., Canton, O.; L. J. Borinstein, Indianapolis; Joseph V. Kiley, T. J. Kiley & Son, Boston; H. S. Grant, Grant Iron & Metal Co., Detroit; and B. H Rubine, Hudson Iron & Metal Co., Bayonne, N. J.

An experience of 33 years—a third of a century—backs Pittsburgh's finer

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ALL GRADES, SIZES AND SHAPES

DRILL RODS
CARBON...HIGH SPEED...ALLOY

SPECIAL SHAPES
SAVE MACHINING...METAL...MONEY

PITTSBURGH TOOL STEEL WIRE CO.
MONACA, PA.

Financial

(*Concluded from Page* 14)

passed upon proposal to split the company's common stock on a two for one basis, and voted to retire 208 preferred shares held in the treasury.

Directors declared a dividend of 37½ cents on the common stock, payable May 10 to April 30 record. Previously a 25-cent dividend had been declared. The regular quarterly preferred dividend of $1.75 was declared payable as of the same dates.

OTHER FINANCIAL REPORTS

Virginia Iron, Coal & Coke Co., Roanoke, Va., first quarter net of $8950 compared with deficit of $49 in first quarter of 1934.

L. A. Young Spring & Wire Co., Detroit, first quarter net of $520,-

932; first quarter net in 1934, $311,-883.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., first quarter profit of $2,326,496; first quarter loss year ago, $1,776,152.

National Enameling & Stamping Co., Granite City, Ill., 1934 net of $372,000 compared with 1933 profit of $274,000.

Acme Steel Co., Chicago, for 1934, net profit of $1,020,533, compared with net of $965,567 in 1933.

M. A. Hanna Co., Cleveland, for first quarter, net income of $422,-317; in same quarter of 1934, net income of $380,269.

Midland Steel Products Co., Cleveland, first quarter net of $344,031; year ago, profit of $70,857.

Link-Belt Co., Chicago, profit of $200,978 for the March quarter, with a net of $118,076 in the same quarter of 1934.

Labor

ABOUT 50 representatives of expelled lodges of the Amalgamated Association of Iron, Steel and Tin Workers, which convened its sixtieth annual convention in Pittsburgh, April 23, sought an injunction to compel the Amalgamated to recognize them—the rank and file group—as delegates. Judge Ambrose B. Reid denied the injunction. After again being denied entrance to the convention the insurgents went to a nearby hall and went into conference.

BAR IRON WAGE RATES HOLD

Wage rates in bar iron mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be unchanged for May and June, bar iron sales price averages in March and April being the same as in January-February. The card rate on boiling, bar and 12-inch mills is 2.00c, and on guide and 10-inch mills 2.10c.

STEEL EMPLOYMENT RISES

Iron and steel industry employes in March numbered 425,189, up 4792 over February, states the American Iron and Steel institute. Total wages in March were $46,764,185, an increase of $2,551,326. Average hours per week per man in March were 33.9 against 35.6 in February. The average hourly wage in March was 65.7 cents, compared with 65.8 cents in February.

ABP RAPS SHORT WEEK

Associated Business Papers Inc., of which STEEL is a member, has released a report summarizing opinions of business paper editors on the 30-hour week bill. The conclusions of these editors are that passage of the bill will result in widespread strikes, general labor unrest and loss of business confidence. Copies may be obtained through STEEL at 10 cents each.

MORE IDLENESS IN MARCH

Unemployment in March totaled 9,760,000 persons, a decline of 125,-000 persons or 1.3 per cent from February but an increase of 366,000 persons or 3.9 per cent over March, 1934, states the National Industrial Conference board, New York.

Meetings

MIDDLE Atlantic group of the American Society for Metals will hold its fourth sectional meeting at the Hotel Pennsylvania May 24. On the agenda are papers and discussions on stainless steels, heat treatment in protective atmospheres, toolroom practices, metallography, and the role of metals in the transportation industry.

NIA GOES TO PITTSBURGH

National Industrial Advertisers association has accepted the invitation of the Industrial Advertising council, Pittsburgh, to hold its 1935 convention in Pittsburgh on Sept. 16. D. C. Grove, advertising manager of the Blaw-Knox Co. and president of the Industrial Advertising council, Pittsburgh, will be general chairman.

NAME 6 MEN TO COUNCIL

National Metal Trades association, to hold its thirty-seventh annual convention in Cleveland, May 15-16 at Hotel Cleveland, has re-nominated all officers for next year and nominated six new men for the administrative council:

Philip Morgan, Morgan Construction Co., Worcester, Mass.; Roe S. Clark, Package Machinery Co., Springfield, Mass.; W. L. Hinds, Crouse Hinds Co., Syracuse; K. T. Keller, Chrysler Corp., Detroit; J. R. Kinney, Kinney Mfg. Co., Boston; David Wilson, Willys-Overland Co., Toledo, O.

FORM MILWAUKEE WELDERS

Otto Voss, Allis-Chalmers Mfg. Co., West Allis, Wis., was elected chairman at the first meeting of the Milwaukee section of the American Welding society, April 18, K. L. Hansen, Harnischfeger Corp., was elected vice chairman and J. J. Chyle, A. O. Smith Corp., was elected secretary-treasurer. Speakers included R. S. Helmkamp, J. R. Houston and J. A. Stemper.

McAllister Heads Harvester

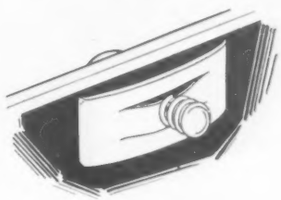
S. G. McAllister, a vice president of the International Harvester Co., Chicago, Friday was made president, succeeding A. E. McKinstry, resigned.

Activities of Steel Users and Makers

NATIONAL CAN CO. INC. is the new name for Metal Package Corp. Executive offices of the company continue at 110 East Forty-second street, New York.

• • •

Pennsylvania Industrial Engineers, 50 Penn avenue, Pittsburgh, has moved to 2413 Magnolia street, N. S.,



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Cleveland, Ohio

Pittsburgh, with increased floor space in the new location.

♦ ♦ ♦

Ekstrand & Tholand Inc., New York, Swedish iron and steel specialties, has moved from 122 East Forty-second street to 441 Lexington avenue.

♦ ♦ ♦

Truscon Steel Co., Youngstown, O., has moved its Pittsburgh district sales office from the Grant building to the twenty-fifth floor of the Oliver building.

♦ ♦ ♦

Lancaster Iron Works Inc., Lancaster, Pa., has moved its New York offices from 370 Lexington avenue to 220 East Forty-second street, room 1910.

♦ ♦ ♦

American District Steam Co., North Tonawanda, N. Y., has appointed United States Supply Co., Omaha, Nebr., exclusive sales agent for Nebraska, western Iowa and northeastern Wyoming. Products of the former will be carried for users in this area.

♦ ♦ ♦

United Chromium Inc. has moved its office and laboratory to larger and more conveniently located quarters at 2751 East Jefferson avenue, Detroit. The new location is designed to give the company's licensees better service. New equipment has been installed and facilities for expansion are in reserve.

♦ ♦ ♦

Werra Aluminum Foundry Co., Waukesha, Wis., is being reorganized and its entire assets have been sold to a group of Waukesha industrialists represented by Charles E. Nelson. A new corporation is being organized to take over the assets and continue the business. Julius Werra, receiver, will head the new company and Conrad Werra, founder and president, will continue in an advisory capacity.

♦ ♦ ♦

Sta-Rite Products Co., Delavan, Wis., manufacturer of small pumps from 250 to 600 gallons per hour capacity, has started production in its new plant, costing about $25,000. W. H. Hazard, president and treasurer, was for many years associated with the pumps division of Fairbanks, Morse & Co., at Three Rivers, Mich., and Beloit, Wis. A. J. Specht, superintendent, was his assistant at Beloit. A series of deep-well pumps will be introduced later.

Welders Review Year of Progress

(*Continued from Page* 13)

start has also been made in the organization of new sections at Salt Lake City and Denver. New York is considering an extension course for welding operators. Cleveland has been increasing its membership, especially the sustaining grade. Plans are also being considered for Toledo, O., section.

A net gain of 239 members was made during the year and efforts to enlarge the rolls are expected to be stimulated by publication of a proposed welding manual or handbook.

Work is progressing on a preliminary code report by the committee on rules for welded construction of oil storage tanks. Following the collapse of a welded tank at Tiverton, R. I., more than a year ago, much interest has been shown in the work of this committee. This code will take into consideration many different types and forms of tank construction and will be so formulated as to cause no interference with the ingenuity of enginers in their design work. The new code will furnish data to assist engineers in the production of welded tanks that will be pre-eminently safe and that will also give satisfactory service.

A new project on design of welded penstocks has been initiated by the appointment of a committee with Dr. W. F. Durand as chairman, composed of the highest authorities on the subject.

Efforts of the committee to obtain agreement on a plan of uniform qualification rules for operators have been beset with difficulties. There has been emphatic evidence of the desire on the part of many to greatly simplify and abbreviate the qualification test procedure in order to save expense. On the other hand, the regulatory bodies and authorities who are responsible for the welding work covered have resisted too great an abbreviation of the test requirements.

Agree on Compromise

Between these two extremes there seemed, for a long time, to be no easy compromise, until at a recent meeting the modified plan of separating the process qualification from the tests for qualifying the welders was proposed. A revised draft of the proposed code of uniform tests has been prepared and is in the hands of the committee.

This new development is the result of the inevitable consideration that any tests schedule for qualifying a welding operator must, of necessity, embrace the welding process to some extent. In order to qualify, an operator must be provided with suitable welding equipment and materials; the best and most experienced operator may fail in his tests if not provided with a suitable process to demonstrate his fitness.

It is, therefore, the intent of the present proposal of the committee to place the tests on a revised basis wherein the welding process is first qualified to determine its ability to meet any specified requirements, and then by means of a few inexpensive tests, to determine the ability of a welding operator to properly apply that process.

There has been increased activity in the work of the A. S. M. E. boiler code committee. One of the most important questions which the conference committee has been called upon to consider in its recent work is the much-discussed question of acceptability of welding on gas cut plate edges.

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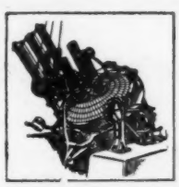

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the welding edges of plates by gas cutting machines has become prevalent, but inspectors who were ignorant of the results of the gas cutting process have been inclined to treat gas cut edges in the same manner as sheared edges and have required the machining or chipping of the gas cut edge down to bright metal.

The recommendation of the conference committee has assisted the boiler code committee in determining the facts and establishing the conditions under which welding on such gas cut edges is permissible.

The final draft of the pressure pipe code which was formulated and formally presented for public hearing and approved by the board of directors of the society is to be incorporated as a part of the American Standards association's general code for pressure piping. The welding section is to be noted as section 5 of the pressure piping code.

The pressure piping code has been finally approved by letter ballot of the sectional committee formulating it and by the A. S. M. E. which is the sponsoring body. It has also been approved by the American Standards association.

Because the National Research council finds it no longer possible to sponsor the work of the American Bureau of Welding and to contribute to its support as it has in the past, and owing to the fact that most of the agencies now co-operating in the work of the bureau are inactive in that connection, there seems to be no good reason for continuing the present form of organization and it has been proposed to make the present work of the bureau an integral part of the activities of the American Welding society.

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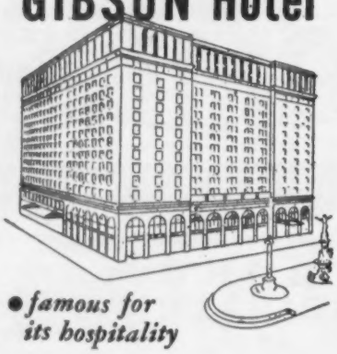

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Equipment

Chicago—Machinery and equipment demand is fairly steady, activity in some types being slightly better than a week ago in both inquiries and orders. Business in heavy steel mill equipment is centered principally in the program of the American Sheet & Tin Plate Co. which is placing contracts for the new 72-inch continuous mill it will build at Gary. Order for foundation work for the mill has been placed with the Powers-Thompson Construction Co., Joliet, Ill. Steel companies as well as railroads continue inactive in the machine tool market. Most machine tool orders call for single units, with little change noted in the total volume. Small tool demand is well maintained.

Boston—Several New England machine building plants shared liberally in recent government awards for arsenal equipment and as a result have substantial backlogs. There has also been an increase in inquiry for the navy for New England delivery. Buying by private industry is steady, but not in large volume.

Pittsburgh—United Engineering & Foundry Co. has been awarded contract by Republic Steel Corp., Youngstown, O., for a 42-inch 4-high cold strip mill to be built at the Republic Warren, O., works for the production of tin plate. The contract, valued at about $300,000, will be produced at United's Youngstown, O., shops. Crane manufacturers will bid April 29 to the Tennessee Valley authority, Knoxville, Tenn., for two gantry cranes, one of 270-ton capacity and the other of 20-ton capacity. In addition, bids will be asked on one 250-ton traveling crane. All three are to be installed at the Norris dam power plant.

Seattle—Improved demand is noted for road and mining machinery, while miscellaneous items are required for public works projects. Tacoma, Wash., has opened bids for a 500-kilovolt ampere transformer and Oregon board of control is considering tenders for X-ray equipment for the state prison.

Construction and Enterprise

Massachusetts

BOSTON—Quartermaster depot, army base, will take bids May 10, circular 110, one motor analyser, one electric lift, 6000-pound, one motor-driven grinder, one motor and radiator flusher, one air compressor, two lubricators, one portable variety woodworker, and one power jack.

SHELBURNE FALLS, MASS.—Considerable machinery and stock of H. H. Mayhew Steel Products Inc. were damaged by fire in the reamer and glass cutting rooms.

WORCESTER, MASS. — Machinery and equipment of the Boston Pressed Metal Co., 171-173 Union street, will be sold at public auction Tuesday, May 7. Industrial Plants Corp., Huntington Bank building, Columbus, O., will conduct the sale.

New York

BUFFALO—Construction of three large elevated tanks and purchase of necessary pumps is planned to improve Buffalo's municipal waterworks. Cost is estimated at $500,000.

ELMIRA HEIGHTS, N. Y.—Elmira Vanities Inc., which will begin production of a line of metal specialties, has awarded contract for the rebuilding of a factory which has been taken over for this purpose.

NEW YORK—Otis Elevator Co., 260 Eleventh avenue, has the contract for modernizing the elevator equipment in the Municipal building, at $1,350,000. The work requires substantial volume of steel, including cable, sheets, plates and structural material.

New Jersey

BURLINGTON, N. J.—United States Pipe & Foundry Corp. is contemplating

(*Please turn to Page* 80)

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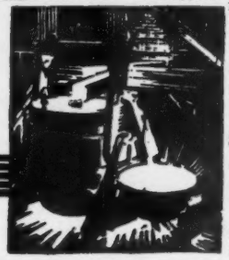

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The scope of the work may be inferred from the 15 chapter headings which include: Facts About the Steel and Iron Base and Iron Oxides and Scale; Acids, Bath Temperature and Pickling Time; Stream, Air and Agitation; Solutions, Tanks and Contaminations; Equipment and Production Principles; Compounds and Inhibitors; Fumes, Ventilation and By-Products; Chemistry of Pickling; Design and Construction of Pickling Tanks; Design of Pickling Departments; Pickling Steel and Copper for Tinning; and, Pickling for Zinc and Lead-Coated Sheets.

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(Concluded from Page 78)

large expenditures for new plants and alterations as soon as conditions warrant, N. F. S. Russell, president, reports. Expenditures will probably go largely into expanding present production of De Lavaud centrifugal pipe.

HARRISON, N. J.—Eastern Industries Inc., manufacturer of dry chemicals, has leased a 1-story building at Second and Bergen streets for use as a warehouse. The building contains 10,000 square feet of floor space.

Pennsylvania

APOLLO, PA. — Pittsburgh Steel Drum Co. last week announced the abandonment of its Apollo, Pa., plant, and removal of facilities to Butler, Pa. It is expected that the Apollo plant, which has made steel drums since 1921, will be disposed of.

ERIE, PA.—Erie Corrugated Paper Box Co. has started work on a 1-story building here estimated to cost $150,000.

MCKEESPORT, PA. — McKeesport Lumber Co. will build a dock and harbor in the Youghiogheny river near here.

PITTSBURGH—Hurley Machine Co., has leased the fourth floor of a 9-story building at 921 Liberty avenue.

PITTSBURGH—Manufacturers Light & Heat Co.'s regulating plant, 2439 Saw Mill Run boulevard, was damaged by an explosion and fire April 18.

Ohio

AKRON, O.—Akron Brass Co., manufacturer of hose couplings and other equipment for fire departments, will add approximately 5000 square feet to the company's present floor space.

BOLIVAR, O.—Ohio Power Co. will relocate its Philo-Canton transmission line near here, with bids to be opened by the war department engineers at Zanesville, O., in the near future. Included in requirements will be 23 towers taking 195 tons of fabricated structural steel.

Michigan

DETROIT—Detroit Edison Co., 2000 Second avenue, has a construction budget totaling $7,200,000 for 1935 which will be used for extensions and replacement of equipment. The principal item of replacement work will be done at its Conners Creek power plant, where the 20-year-old 200-pound steam turbines will be replaced with new 600-pound steam turbines.

PONTIAC, MICH.—Barkeley Corp., Jackson street, has been incorporated to deal in metal specialties, by George W. Barkeley, 240 Rundell street.

Illinois

BECKEMEYER, ILL.—City has applied for PWA grant and loan of $60,000 to finance a waterworks system, including supply main, pumping station, steel tank on tower and distribution mains, fire hydrants, etc.

CHICAGO—Purchasing officer, interior department, will receive bids June 14, schedule 12, for agricultural implements as required for Indian service during the fiscal year 1936.

CHICAGO—Ford Metal Mfg. Co., 43 East Ohio street, has been incorporated to manufacture and sell metal specialties, by Grover M. Herrman, R. L. Oughton and T. C. Ford. Correspondent: American Asphalt Paint Co., 43 East Ohio street.

CHICAGO—Steel Castings Corp., 301 South Hoyne avenue, has been incorporated to carry on a general castings, foundry and machine shop business, by Jerome Jehlen, Jerome E. Jehlen and Mary Jehlen. Correspondent: Childs, Bobb & Wescott, Continental Illinois building, 231 South LaSalle street.

DEKALB, ILL. — Kohler-Browne Corp., manufacturer of metal specialties, has practically completed negotiations for the removal of its plant to Crystal Lake, Ill.

MARISSA, ILL.—Bids will be received by the city clerk's office May 8 on the construction of a waterworks system, estimated to cost $123,0000.

PEORIA, ILL.—Greater Peoria sanitary and sewage disposal district will receive bids May 14 on gas engines and generators, electrical equipment, gas holder and purifiers, a blower building addition and piping for the sewage treatment plant at the foot of Darst street.

Indiana

CONNERSVILLE, IND.—Ready Machine & Tool Die Co. Inc., 121 East Court street, has been formed to manufacture and sell tools, dies and machinery, by Charles P. Ready, also resident agent, Leo J. Moran and Harry M. Moran.

ELLETTSVILLE, IND.—Globe Mfg. Co. Inc., has been formed to manufacture metal products, by Raymond A. Harris, also resident agent, John T. Temple, John W. Goble and Orville W. Woolems.

FORT WAYNE, IND.—Central Iron & Metal Co. Inc., 225 West Superior street, has been organized to deal in scrap iron, by Samuel Schecter, Isadore J. Field and Sol Rothberg.

GARY, IND.—Contract for foundation work for new strip mill to be built here for American Sheet & Tin Plate Co., Pittsburgh, has been placed with Powers-Thompson Construction Co., Joliet, Ill. Section of lake front ground will be reclaimed, necessitating building of new breakwater.

Kentucky

PINEVILLE, KY.—Harlan Industrial Colleries Co. has been incorporated with $10,000 capital by J. M. Pursifull and K. R. Ketcham, to operate a coal mine.

Alabama

BAY MINETTE, ALA.—Bay Minette Co., recently incorporated by N. M. McInnis and E. S. Sibley, has acquired plant of the Stover Mfg. Co. which it is planning to enlarge and will install a planing mill and dry kiln.

BIRMINGHAM, ALA.—Robert Jenison Jr., Spring Lake Farm, Springville road, plans rebuilding burned building, and will install dairy barn and milk house equipment.

BIRMINGHAM, ALA. — Woodstock Slag Corp. is planning to open a branch in Anniston, Ala., soon. Slag from the Swann Chemical Co. there will be processed and shipped to Birmingham.

BIRMINGHAM, ALA.—Hill & Griffith Co., manufacturer of foundry supplies, is constructing an office and warehouse at 921 Seventh avenue, North, to replace the building damaged by fire last December. Cost is estimated at $30,000.

TUSCUMBIA, ALA.—City, W. L. Farr, mayor, has completed loan contract with PWA totaling $130,000 and will soon call for bids for electric distribution system. Lude & Adler, engineers, Woodward building, Birmingham, Ala.

District of Columbia

WASHINGTON—Veterans administration, construction service, will take

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WASHINGTON—Bureau of supplies and accounts, navy department, will take bids May 10, schedule 488, for motor-driven vertical milling machine; schedule 4900, for motor-driven radial cam grinder machine, both delivered at Philadelphia.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 30, schedule 4807, motor-driven toolmakers' precision lathe, delivered Submarine Base, Conn.; schedule 4818, pumps and spare parts; schedule 4833, spot welding equipment, delivered Mare Island, Calif.; May 3, schedule 4839, one motor-driven geared head engine lathe, delivered Submarine Base, Conn.; schedule 4840, one motor-driven light duty engine lathe, delivered Puget Sound, Wash.; May 7, schedule 4853, hydraulic pumps and motors, delivered Portsmouth, N. H., and Mare Island, Calif.

Georgia

ATLANTA, GA.—Warren Co., 905 Fair street, manufacturer of refrigerators, is planning to rebuild the portion of its plant recently damaged by fire.

TOCCOA, GA.—City, E. P. Bridges city manager, is having plans prepared by Robert & Co., engineer, Atlanta, Ga., for waterworks system at a cost of $40,000.

Louisiana

NEW ORLEANS—United States engineer office, first district, takes bids May 2, circular 353, one gasoline-driven truck mounted centrifugal pump and accessories.

North Carolina

OLIVIA, N. C.—H. C. Cameron is rebuilding his burned sawmill unit.

WINSTON-SALEM, N. C.—W. J. Fishel is erecting a welding shop at 532 North Main street.

Tennessee

MEMPHIS, TENN.—Forest Products Chemical Co., Chelsea avenue, has acquired property of the Union Charcoal & Chemical Co. which it will probably remodel as part of its expansion program.

MEMPHIS, TENN.—Union Barge Line Co., 302 Penn avenue, Pittsburgh, has leased 12 acres here with frontage on the Wolf river, for the purpose of building river and terminal facilities, involving an expenditure of about $200,000.

Virginia

BUCHANAN, VA.—City has PWA loan and grant of $66,000 for waterworks.

CULPEPER, VA.—Town receives bids May 9 for complete sewerage treatment plant.

PORTSMOUTH, VA.—Nanesmond ordnance depot, commanding officer, will take bids May 1 circular 53, for motor driven grinder, motor-driven motor buffer, planer vise, motor-driven drill pointer, and one 1-horsepower and one 2-horsepower motors.

Arkansas

CLARKSVILLE, ARK.—Clark Coal Co. plans rebuilding burned coal tipple.

Texas

CLEVELAND, TEX.—City is having preliminary plans prepared for waterworks supply and distribution system and sewage collecting and disposal system. Cost is estimated at $80,000. M. C. St. John, engineer, Esperson building, Houston, Tex.

HEMPSTEAD, TEX.—City has preliminary plans for waterworks supply and sewage collecting and disposal system. Cost is estimated at $75,000. M. C. St. John, engineer, Esperson building, Houston, Tex.

NAVASOTA, TEX.—Jasper Veneer & Mfg. Co. Inc., Jasper, Tex., has acquired a site outside of city and will erect a veneer plant with capacity of 300,000 board foot per month.

SAVOY, TEX.—City, Bryant Penn treasurer, receives bids after May 6 for waterworks system to include deep well, 100 foot steel tower and 65,000 barrel storage tank and system of mains and pump.

SOUTHSIDE PLACE, HARRIS COUNTY, TEX.—J. P. Lindsay, mayor, will take bids May 3 for furnishing materials and constructing waterworks, including installation of service pumps, piping and valves in pumping plant, 50,000-gallon steel tank elevated on 100-foot steel tower and also furnishing and installing deep well turbine pump with capacity of 250 gallons per minute.

Wisconsin

GREEN BAY, WIS.—Miller Scrap Iron & Steel Co. has been incorporated with $5000 capital by Herman and Fannie Miller and Frank Volm.

MARKESAN, WIS.—Wisconsin Power & Light Co., Madison, Wis., expects to rebuild promptly its gas plant here, badly damaged by explosion April 14.

MELLEN, WIS.—Mellen Granite Co. has applied to state public service commission for authority to build a power dam across Potato river one mile south of Gurney, Wis. Proposed investment has not been disclosed.

MILWAUKEE — Wisconsin Steel Tubes Inc. has been organized with 150 shares of no par value stock to manufacture containers for gas, fluid, etc. The principals are represented by Aaron Scheinfeld, attorney, 735 North Water street.

STEVENS POINT, WIS.—Board of education has engaged Law, Potter & Law, architects, Madison, Wis., to prepare plans for proposed new $400,000 high school.

Minnesota

COTTON, MINN.—American Moss Peat Co. has started construction of a factory, 38 x 216 feet, to cost $50,000.

DULUTH—Diamond Calk Horse Shoe Co., Otto Swanstrom president, is constructing a private power plant in present factory building, to cost $50,000, including installation of two new boilers, two stokers, two engines, two generators and other power plant equipment. Frederick C. Perry, Alworth building, is consulting engineer.

DULUTH—Arrowhead Culvert & Pipe Works has been organized as a subsidiary company of the Lyle Culvert & Pipe Co., Minneapolis, and has purchased the machinery and equipment of the former Western Steel Products Co., New Duluth, for the manufacture of corrugated metal culverts.

OWATONNA, MINN.—City public utility commission will receive bids until May 13 for construction of an addition to the municipal power plant to cost $75,000.

ST. PAUL—Superior Packing Co. has awarded contract for construction of a 2-story addition to packing plant, 39 x 40 feet.

South Dakota

ROUBAIX, S. DAK.—Anaconda Mining & Milling Co. is rebuilding the Clover Leaf mine, including the complete electrification of the property, installation of electric pumps, electric mill equipment, drills, etc. J. Lansing White, consulting engineer, is in charge of the work.

SIOUX FALLS, S. DAK.—City plans installation of a new generating unit at the municipal power plant, to cost $175,000.

Iowa

CLINTON, IOWA—Curtis Bros. & Co., millwork manufacturer, plans rebuilding of factory damaged by fire on April 10. Considerable machinery, as well as raw materials, were severely damaged.

NEWTON, IOWA—Maytag Co., manufacturer of washing machines, has started construction of a 4-story factory addition, 12 x 135 feet, to cost $25,000.

NEWTON, IOWA—Newton Wood Fixture Co. has been organized to manufacture cabinet and millwork products. K. B. Schoonover has been appointed manager.

Nebraska

COLUMBUS, NEBR.—Loup river public power district, Harold Kramer, secretary, will receive bids until May 1 for furnishing 920 tons of fabricated structural steel for bridges across canal, being part of the $7,300,000 Loup river diversion dam and hydroelectric project.

NORTH PLATTE, NEBR.—Platte valley public power and irrigation district, Gerald Gentleman, secretary, will receive bids until May 2 for construction of a power plant building, 45 x 80 x 117 feet, involving 220 tons of reinforcing steel.

Pacific Coast

OAKLAND, CALIF.—A fire which broke out in the dyeing room of the Hammer-Bray Stove Mfg. Co. at Twenty-sixth avenue and East Twelfth street, caused considerable damage to the building and equipment.

ASTORIA, OREG.—Columbia River Packers association plans immediate construction of a $25,000 cold storage plant and wharf facilities at North Bend, on a site leased from the Port of North Bend.

SEATTLE—Union Oil Co. has called bids for a $15,000 addition, 33 x 51 feet, to its office building, 2901 Western avenue, and also for a proposed steel and sheet metal warehouse at 3001 Elliott avenue.

SPOKANE—City officials have rejected a proposed government loan of $625,000 for a projected municipal hydroelectric plant and dam and will issue a bond issue of $470,000 instead, with the government furnishing the remainder as a direct grant.

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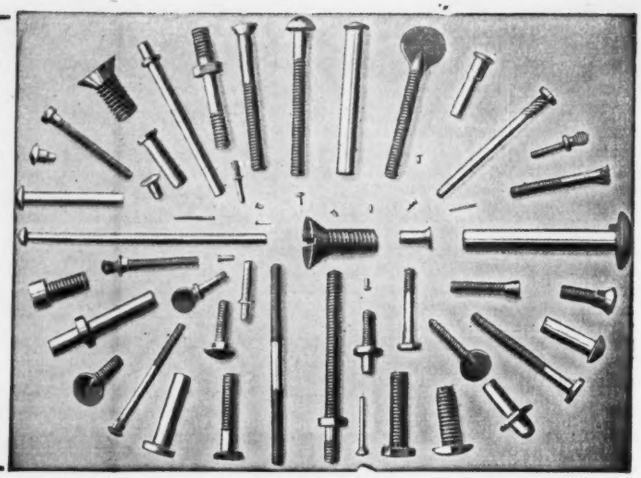

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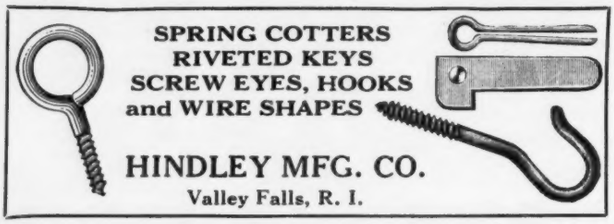

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